farm Chemicals

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Bemis dress print cotton fertilizer bags...

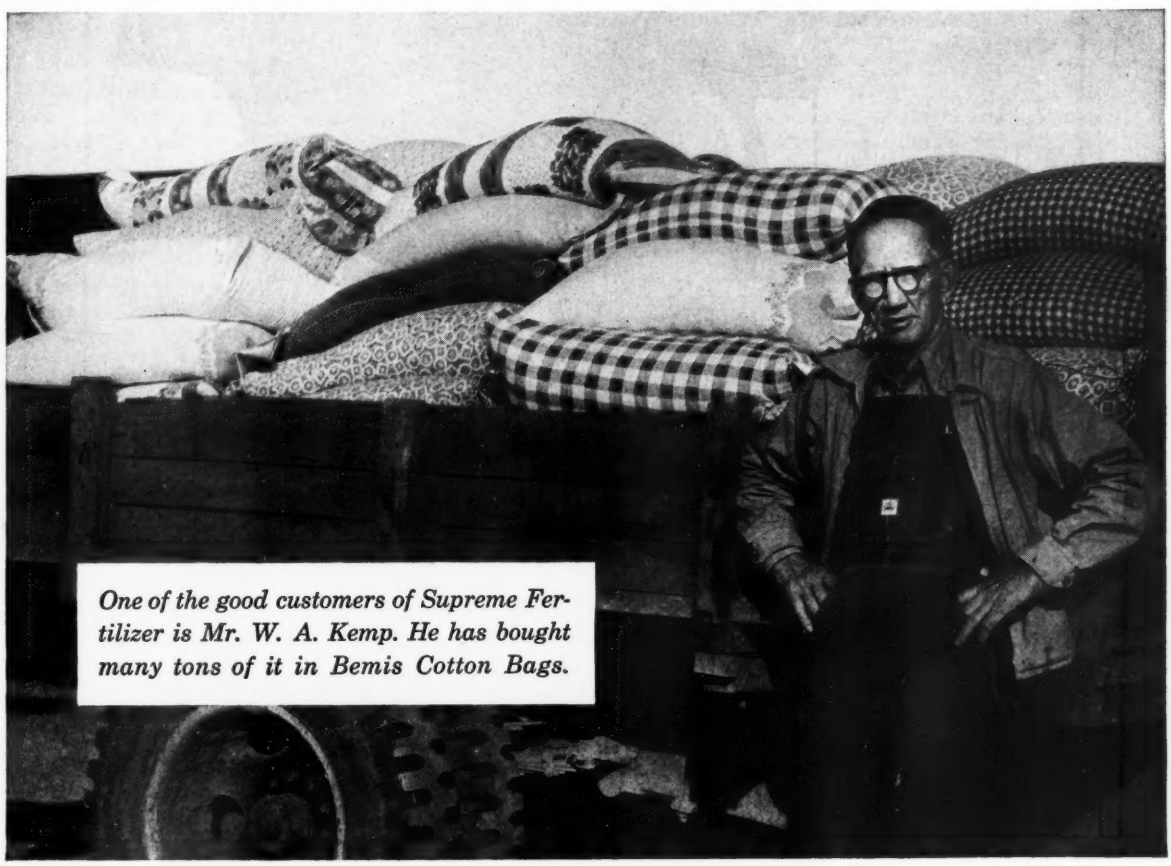
"the extra that pushes a sale ~~our~~ *your* way!"

Read this statement from Mr. Hugh Latimer, vice-president of the Supreme Feed & Fertilizer Co., of Philadelphia, Miss. It really tells the whole story . . . shows why YOU will benefit by packing YOUR fertilizer in Bemis Cotton Bags.

"We have noticed that an attractive Bemis Dress Print Bag can often be the extra that pushes a sale our way. In most farm families, that piece of goods is a bargain that makes them happy and keeps them friendly."

Hugh Latimer

Hugh Latimer, Vice-President
Supreme Feed & Fertilizer Company



One of the good customers of Supreme Fertilizer is Mr. W. A. Kemp. He has bought many tons of it in Bemis Cotton Bags.

Bemis

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In this issue . . .

It's already being used in one pesticide and there is promise of its use in several others . . . that's the story so far on Marathon Corp.'s Maracarb N, a catalyst deactivator. Naugatuck Chemical Division of U. S. Rubber says the material is excellent in its Aramite formulations. For complete details on use of Maracarb N and what's expected of it for the future, turn to page 13.

A new type of expansion is going on in the fertilizer industry, according to one of its foremost leaders, Dr. Vincent Sauchelli, of Davison Chemical Corp. Dr. Sauchelli tells why in the article on page 15, focusing his attention on the role of phosphates and the part they play in fertilization.

A minor revolution in the cotton South may be coming about with widespread use of the potent herbicide Chloro-IPC. A direct descendent of the earlier IPC, it has given excellent control of weeds in cotton and other crops in tests conducted to date. Read about the product in the roundup article starting on page 22.

Just about every phase of fertilization was discussed at the fourth annual fertilizer conference of the Pacific Northwest Plant Food Association last month at Pullman, Wash. Summaries of talks of particular interest to members of the fertilizer industry are presented in the article on page 26.

A dramatic shipment of a special DDT formulation to the frigid north and a battle against snakes are part of the story of Diamond Alkali Organic Chemicals Division. It's the latest article in the FARM CHEMICALS series on fertilizer and pesticide plants. For photos and further details, see page 30.

Other articles include a report on ***superphosphate*** in 1952, page 37; an insecticide testing program for ***grasshopper control,*** page 40 and a summary of ***potash*** production last year, page 47.

Next Issue . . .

An article on production of ***liquid fertilizers*** at "Na-Churs" Plant Food Co. . . . a story on 12–12–12 ***nitraphosphate fertilizer*** at Nitrogen Division's new South Point, O. plant . . . ***a special section on National Agricultural Chemicals Association,*** in line with its 20th Anniversary convention at Spring Lake. Including a guest editorial by President Arthur W. Mohr, reminiscenses by Executive Secretary Lea Hitchner, a summary of legislative problems by Joseph A. Noone, NAC adviser, and reports on the NAC technical advisory and traffic committees by their heads, Dr. L. Gordon Utter and John J. Lynch, respectively. Also scheduled are comments by past presidents of NAC and other industry leaders and regular FARM CHEMICALS features of interest to members of the fertilizer and pesticide industries.

farm chemicals

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PIONEER JOURNAL OF THE FARM CHEMICALS INDUSTRY

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Cover Story

Chlorine from tank car starts flowing to BHC unit line at Diamond Alkali's Houston, Tex., plant as worker makes connection. Building in background is Organic Chemicals Division's DDT plant, then under construction. Read the full story on Diamond's pesticide activities, and the development of this important industry member, *page 30.*

A magazine international in scope and circulation and devoted to manufacturers, mixers, and formulators of fertilizers and pesticides

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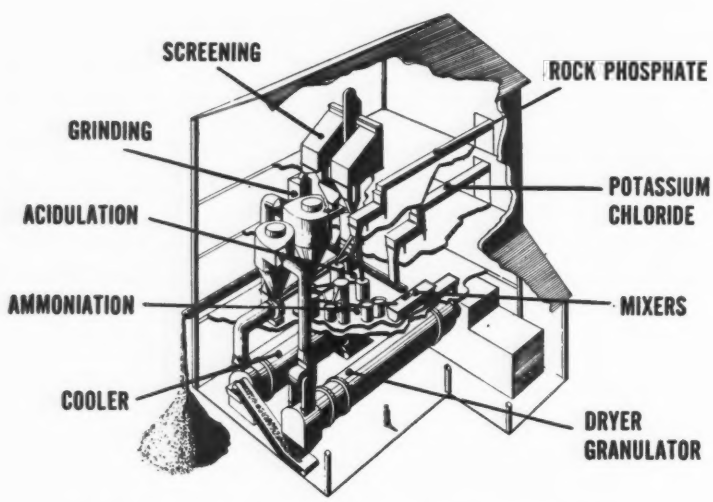

Examples of Formulae Produced by St-Gobain Process

N%	P_2O_5%	K_2O%	
10	10	17	(sulfo-nitric acidulation)
11	11	11	" " "
10	15	20	(phospho-nitric acidulation)
12	15	18	" " "
12	12	20	" " "
14	14	14	" " "
10	20	20	" " "

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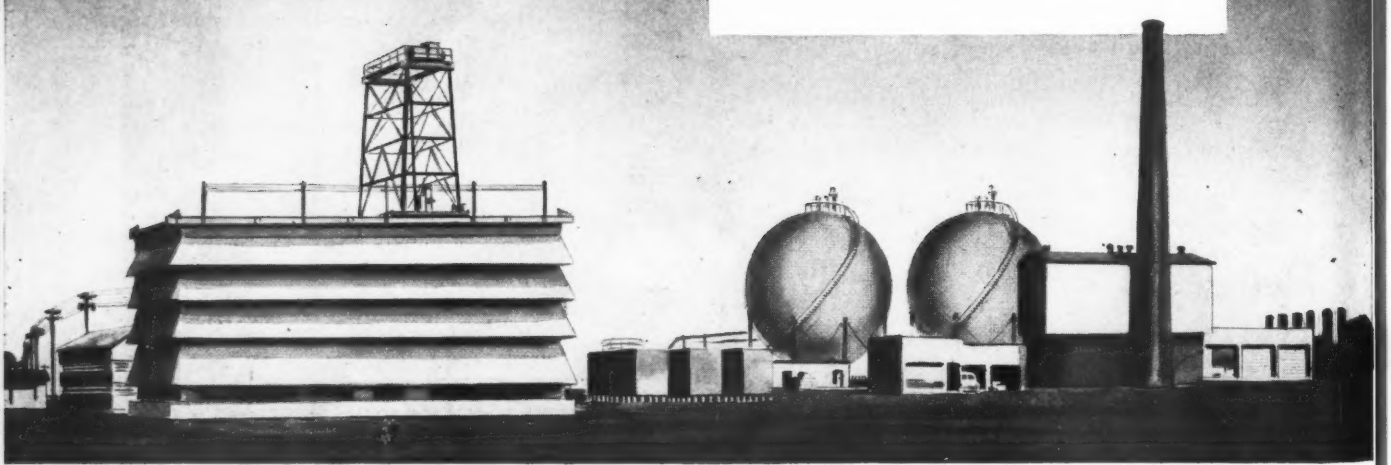

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farm chemicals facts

. . . Briefly Noted

Charles E. Workman is new assistant sales manager for the fertilizer division of Virginia-Carolina Chemical Corp., according to an announcement made last month by C. Cecil Arledge, vice president. Workman joined the fertilizer sales staff in 1937 and has been manager of the East St. Louis, Ill. office since 1947. His new headquarters will be in the home office of the corporation in Richmond, Va.

Workman

Radioactive insects and insecticides will be used to find how far and how fast insects fly, how an insecticide kills an insect and just how some insects develop resistance to insecticides, according to plans of USDA entomologists.

Two USDA employes, Randall Latta and A. W. Lindquist, were awarded honorary degrees of Doctor of Science from Iowa Wesleyan College and Bethany College, Kan., respectively.

DDT combined with methyl parathion or metacide may control many cotton enemies according to entomologists of the USDA. Large-scale spray tests in the Lower Rio Grande Valley in 1952 indicate that these combinations may give farmers plagued by these pests a way of producing cotton more economically.

Died: L. W. Rowell on July 12. Rowell retired as vice president of Swift & Co. in 1944 after 48 years with the company. He was active in NFA and headed the organization for several years.

Died: F. R. Curtis, manager of the Shreveport, La. district sales office of Chilean Nitrate Sales Corp., on July 13. Curtis had been associated with Chilean Nitrate Educational Bureau, Inc. and later with the sales corporation, for 26 years.

Two new field representatives for Eston Chemicals Div. of American Potash & Chemical Corp. are Truman E. Laningham and Jack Triche. Laningham will serve Eston's basic chemical department in Modesto, Cal. Triche will be in charge of the refrigerants distribution branch at St. Louis.

Chase Bag Co.'s new regional sales directors are J. A. Brewster, J. H. Counce and J. P. Grady. They will direct, respectively, the western, southern and eastern regions.

A warning was issued by the National Fertilizer Association to the American public to be on guard against fallacious claims being made by some manufacturers of liquid fertilizers for home garden use. Consumers were urged to buy only from reliable firms, to be sure the product is approved and registered with state fertilizer control offices and to secure and follow fertilizer recommendations of state experiment stations.

Waste feathers now can be converted into a valuable organic nitrogen fertilizer, according to a report from the USDA's Bureau of Agricultural and Industrial Chemistry. The development provides a new outlet for the 100 to 150 million pounds, dry-weight basis, of feathers that accumulate each year in poultry processing plants over the country.

Dr. Gordon Taylor has been appointed assistant to Director James G. Horsfall of the Connecticut Agricultural Experiment Station.

CALENDAR

Aug. 25—Field Day for Fert. Industry, Ohio Exp. Station, Wooster.

Sept. 7-9—50th Anniv. American Soc. for Hort. Science, Wooster, O.

Sept. 9—Synthetic Organic Chem. Mfrs. Assn. Meeting, New York.

Sept. 9-11—NAC 20th Anniv. meeting, Spring Lake, N. J.

Sept. 16—Efficient Lime, Fert. Usage Meeting, Richmond, Va.

Acting manager of Pittsburgh Agricultural Chemical Co. is Herbert F. Tomasek. He will make his headquarters in New York City. William J. Haude, former president of the company has resigned and will reside in the Middle West.

Success with dieldrin for control of chinch bugs has been reported by Shell Chemical Corp. The periodic destroyers of American grain crops for 150 years made their first serious reappearance in nine years but are being brought under control with the pesticide.

Colorado potato beetles which DDT failed to kill, recently threatened a large portion of Long Island's $30 million potato crop. The fields now are being sprayed with methoxychlor, an insecticide rarely used on potatoes, DuPont reports.

Quarterly dividends of 40 cents a share on common stock and one dollar per share onfour per cent cumulative preferred stock were issued June 30 by the board of directors of International Minerals and Chemical Corp.

Henry G. Herrell has been named assistant chief in charge of administration of the Bureau of Entomology and Plant Quarantine of the USDA. He succeeds Ralph A. Sheals, who retired June 30.

Plant diseases that are spread by means of infected seed stock may be controlled by detecting disease organisms on seeds before they are planted, according to New York Experiment Station.

A decrease of one per cent was shown in fertilizer purchases of member countries of the O.E.E.C. in 1951-52 as compared with 1950-51, according to a survey conducted by the organization's Food and Agriculture Committee. It estimated a six per cent rise for the whole area in 1952-53 and a further rise of six per cent for 1953-54.

Tests conducted this year with CMU as a pre-emergence treatment for weed control in beets on mineral soils by the New York Experiment station were very favorable. Weeding costs for an acre of beets may be reduced to about 1/5 of the usual cost, the station reports.

farm chemicals outlook

Report from Washington
by Fred Bailey & John Harms

The current farm situation is loaded with meaning for the chemical industry . . . and the entire economy. Trends building up on the farm front, could, in view of many officials here, rock the nation if they are not checked.

Don't be misled into discounting the potential effect of a more pronounced farm recession . . . because of boomy pace now enjoyed by many segments of industry.

The big farm population is coming back into focus as a major power influencing the over-all economy . . . now that the Federal government is slowing the pump which has poured billions into defense and security.

Farm decline now affects about one-third of our population in some measure . . . for that many people live on farms and in rural areas. Chances for spreading decline from such a large base to other parts of economy . . . especially those serving agriculture . . . are rated high. Retrenchment on farms already is affecting some industries.

Here, briefly, is what's taking place in rural areas:

1. Prices farmers receive for things they produce have been in a tail-spin for two years, down almost 18 per cent since early 1951. At the same time, prices farmers pay for things they buy have receded only about three per cent.

There appears to be little chance that prices farmers receive will show more strength for the rest of the year. On the contrary, odds favor even lower prices this fall. Purchasing power on farms now is lowest since before World War II.

2. Smaller export markets pile up surpluses of such things as wheat, cotton and tobacco . . . contribute most to lower prices. Takings by foreign countries this year totaled more than 30 per cent less than a year ago.

3. Drought aggravates situation. Almost six million acres of Southwest farm and ranch land have been hit by what is termed the worst drought on record for many areas. Drought-stricken farmers and ranchers are forced to sell cattle at loss . . . many have crop failures this year.

Drought is spreading. Some sections of Southwest have had drought for past four years . . . little dust bowls are growing into bigger ones. A continuation of drought, especially if it goes through next year, may start something like the Okie migration of 20 years ago.

Congress leaves Washington with great plans for the second session of the 83rd this winter. Legislators are counting on the next term to make their records for spreading before the populace come November 1954 when most of them come up for re-election.

But because many major pieces of legislation have been shoved on the back burner for action next year . . . Republicans may not have time to fulfill all the campaign promises of last fall. Such things as revision of Taft-Hartley law, changes in Social Security, revision of the entire tax structure, Hawaiian state-

hood, Reciprocal Trade Agreements Act . . . all are scheduled to come up again when Congress meets in January.

Miller pesticide control bill received widespread support at House hearings held last month. But as we went to press, the Senate had made no plans for hearings and it was doubtful this legislation would clear Congress this session.

(For details of another House hearing at which several leaders opposed the bill, see page 76.)

Private industry's participation in the government's atomic energy monopoly will be a burning issue in the next session. To deal industry in will take a revision of the seven-year-old McMahon Act, which makes it illegal for anyone but the government to own nuclear reactors or fissionable material.

The chemical and electric power industries are ready to take over the atom for peacetime-use. President Eisenhower, Atomic Energy Commission Chairman Strauss, and the Joint Congressional Atomic Energy Committee have expressed favor toward the idea.

You can look for more . . . not less . . . government in agriculture. Agriculture Secretary Benson has pigeon-holed his ideas about cutting down the size of government farm-help programs for the immediate future. Emergencies brought on by drought, surpluses, and export declines have forced him to go as deep, if not deeper, than any recent USDA bosses.

But while Benson is forced reluctantly to do more for farmers, he believes he can be more persuasive with Congress next year when current high price support laws expire. He will attempt to put across his ideas of greater economy, lower support prices, less regimentation.

We don't see much chance of success for Benson in his congressional relations next year. Tip-off to what Congress will do on farm programs next year, when current high support laws run out, comes from Chairman Aiken of Senate Agriculture committee. Aiken says he doesn't look for much change in farm laws. His counterpart in the House, Rep. Clifford Hope, also is skeptical that price support programs will be changed a great deal.

Near-record storage supplies of grains are prompting USDA's Bureau of Entomology to plan expansion of investigations into control of insects of stored grain . . . including pesticidal use and methods of application.

Annually, these pests chew up an estimated $260 million worth of corn . . . $135 million in wheat . . . $53 million worth of oats and so on.

Write for free insect reporting service from the Bureau of Entomology. Many chemical companies are finding this new government service of great value in determining where economic infestations will occur. Address: Section of Economic Insect Detection and Reporting, Bureau of Entomology and Plant Quarantine, USDA, Washington 25, D. C. Farm Chemicals publishes a monthly resume of latest reports.

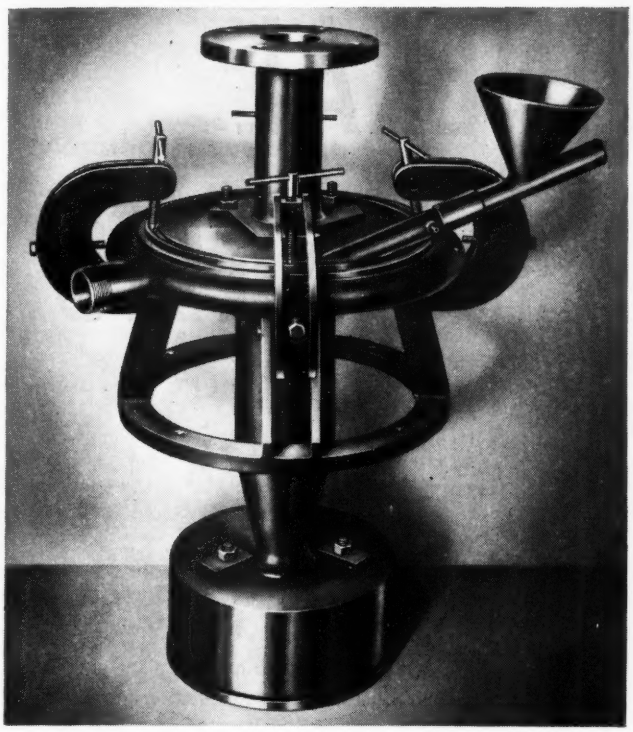
Salesmen of some companies were able to make use of the weekly report this spring when the armyworm went on the march and in other early insect developments.

This is first year reporting service on present scale was available for the 48 states. Officials say that improvements in the program will make its true worth felt next year. This year it's mostly on a trial and error basis . . . but still one of the best such services available.

1953 is turning out to be a "fairly average" pest year . . . according to officials here. Some areas of severe infestation, such as armyworm and boll weevil, are making up for lighter infestations in other areas.

While demand for pesticides now is averaging about normal . . . lifting some of the pressure on inventory build-up . . . officials are concerned about possible over-expansion on future needs of such things as DDT and BHC. While production capacity for these two is great, many entomologists favor use of other insecticides providing greater degree of safety in farm use.

Announcing the STURTEVANT



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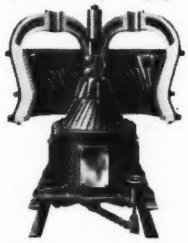

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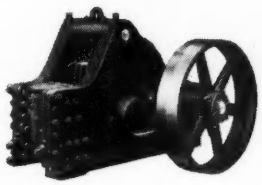

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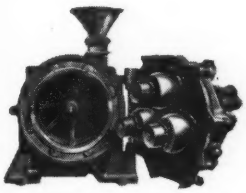

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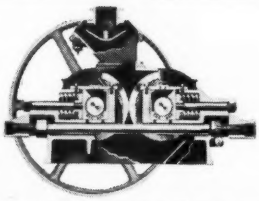

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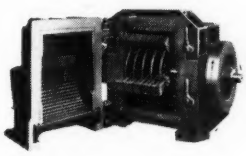

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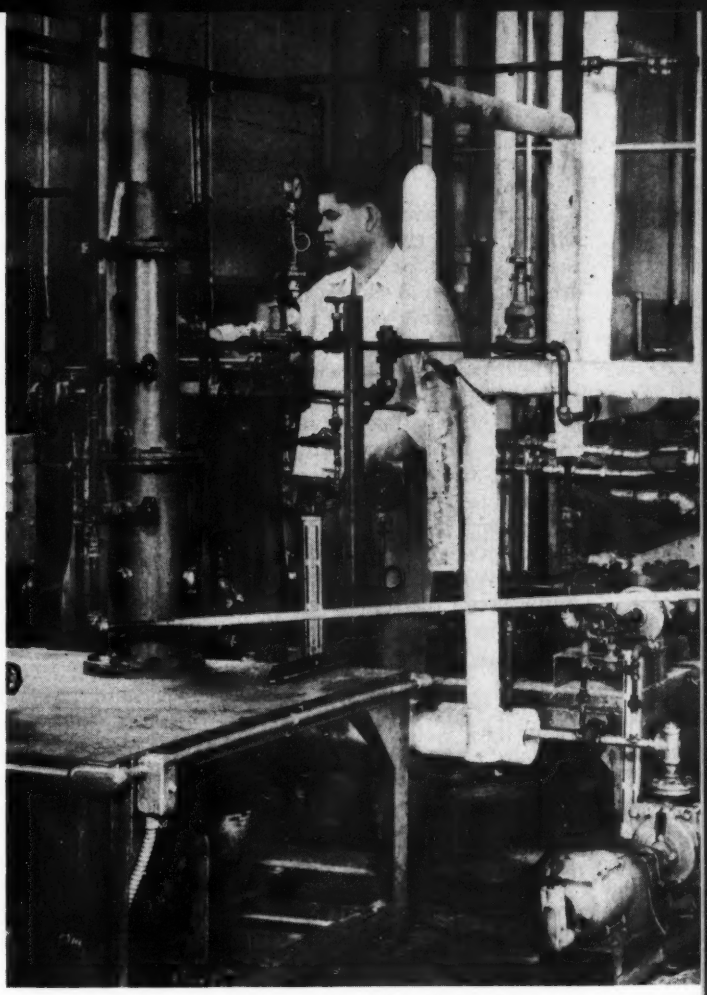


Research worker in pilot plant for study of lignin processes and products at Marathon.

MARACARB N, highly successful thus far when used with one insecticide, is attracting widespread attention as the latest product developed by Marathon Corp. for use in the pesticide industry.

The Marasperses, the company's line of dispersing agents, already are noted for their stabilizing effect in the presence of hard water and their use in the preparation of agricultural sprays.

Now the Rothschild, Wis., organization has added Maracarb N.

Used by Naugatuck

Naugatuck Chemical Division of U. S. Rubber Co. reports that it is the best catalyst deactivator available. Naugatuck uses Maracarb N in the production of the miticide Aramite with excellent results.

Maracarb N is a complex mixture of the sodium salts of lower molecular weight lignosulfonic acids and the alkaline hydrolysis products of pentoses and hexoses which are extracted from coniferous woods.

It is a liquid product, having a concentration of approximately 50 per cent solids and is neutral in *p*H.

In turning to Maracarb N for its miticide, Naugatuck was looking for a solution to the knotty problem of decomposition of some farm chemicals—particularly the chlorinated hydrocarbons—during or after formulation into pesticidal products.

Often this decomposition is the fault of the carrier used in the formulation. The property of the carrier or diluent to promote decomposition is known as catalytic activity.

Catalyst Deactivator

After extensive laboratory trials, Naugatuck found that the new Marathon product had excellent catalyst deactivating properties.

Marathon feels that, because Maracarb N is not phytotoxic, and because it is compatible with all of the farm chemicals tested to date, its function as a catalyst deactivator should be of considerable importance to formulators of farm chemicals.

Naugatuck is using the material with Aramite Technical in wettable powder and dust formulations. Approximately six per cent Maracarb N (dry basis) by weight of the active carrier is needed to deactivate it.

When used to impregnate diluents used with Aramite, Naugatuck researchers report, it has a stabilizing effect on them and prevents decomposition.

This usage of Maracarb N was developed by research workers at Naugatuck. Although the chemical itself was developed by Marathon, Naugatuck has applied for a patent on its usage with farm chemicals and has licensed Marathon to pro-

duce, according to the U. S. Rubber division.

Naugatuck scientists also foresee a big future for the product, stating that it "could be used with any other agricultural chemical which is sensitive and subject to decomposition."

The division started using Maracarb N early this year so it has only sketchy information on its effectiveness. In an acceleration test, however, the division found that Aramite used with Maracarb N did not decompose after a time equivalent to two years of shelf life.

Each year since 1945, Marathon states, use of the company's Marasperses in farm chemical formulations has been increasing in importance. Bulk of Marasperses sold for this type of application went into wettable powder insecticide formulations, with lesser amounts going into the manufacture of lead arsenate and to producers of sulfur, copper, and organic fungicides and herbicides.

For Wettable Powders

The dispersants, particularly Marasperse N, have been found to be very useful in several types of wettable powders.

These include DDT, BHC, toxaphene and parathion.

A basic formula for 75 per cent wettable powder containing Marasperse, the U. S. Department of Agriculture for the World Health Organization has been adopted with minor variations by a majority of manufacturers, according to the company.

The basic formula is as follows:

75% DDT
1% Antaron N-185
1% Marasperse N
23% suitable carrier

Marathon figures that, in general, from 0.5 to 2.0 per cent Marasperse in the total wettable powder formulation is sufficient to give excellent dispersability and stability.

In addition, the Marasperses are low in cost, non-hygroscopic, neutral, effective in both hard and soft water and compatible with many anionic agents.

The Marasperses, in addition to their use as dispersants, also function well as emulsion stabilizers, Marathon further states.

Stabilize Emulsions

Unlike conventional emulsifiers, they do not lower surface and interfacial tensions, rather they stabilize oil-in-water emulsions by preventing the coalescence of the suspended globules of oil.

This means that the oil phase must be efficiently subdivided in suitable mechanical equipment, such as a colloid mill or homogenizer, to obtain a fine grain emulsion.

Once the emulsion has been formed, Marasperse will stabilize it against breaking caused by extreme variations in *p*H, temperature, high concentrations of electrolytes, dilution, mechanical handling and ageing.

Marathon declares that emulsions containing oil concentrations ranging up to 75 per cent by weight can be stabilized with a small percentage of Marasperse.

Development of the Marasperses by Marathon followed a long period of research starting in 1927, when the Chemical Division of the corporation was set up.

All of the diversified products for the pesticide and other industries has come about from the use of the sulfite process in the manufacture of pulp and paper at Marathon's Rothschild mill.

Research Projects

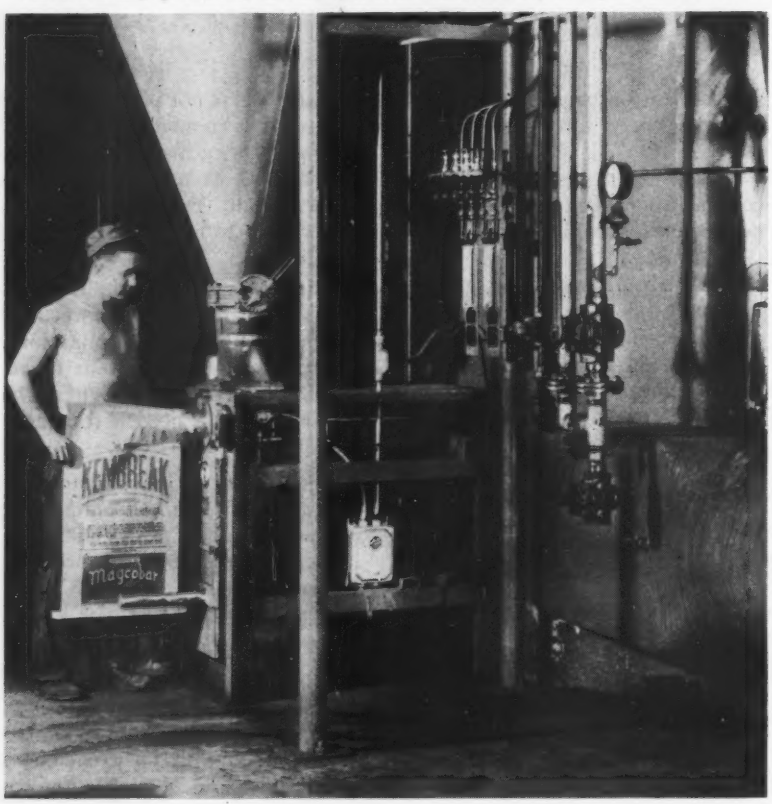
The problem of disposing of sulfite liquor in the paper process lead the company to set up research products to find commercial outlets for it.

Current industrial users of Marathon's lignosulfonate products include, in addition to pesticide formulators, oil well drillers, leather tanners, formulators of boiler water treatments and many others.

The corporation says it has spent more than two million dollars on research to make useful products from lignin.

Pesticide manufacturers, in particular those making chlorinated hydrocarbons, who are interested in the latest of these products, Maracarb N, can obtain more information from the corporation by filling out a **Reader Service** card on page 43 in this issue, using **Code Number 8-3.** ◆

Partial view of one of the spray dryers used in the manufacture of Marathon's many products, one of which is Maracarb N, catalyst deactivator.



Dr. Sauchelli Says . . .

Fertilizer Industry Has 'Come of Age'

By Dr. Vincent Sauchelli
Director of Agricultural Research
Davison Chemical Corp.

THE fertilizer industry of this country is now in the process of rapid and extensive change involving both the product and the makeup of its membership. New kinds of fertilizer are appearing, quite different in physical appearance and chemical composition; corporate businesses having backgrounds remote from fertilizer manufacture are entering the industry.

Formerly the fertilizer industry expanded by doing the same things merely on a larger scale.

Now, expansion is occurring through completely new kinds of operations based on chemical engineering and into consuming areas where until recently fertilizers were hardly known.

Our industry is come of age. We are now one of the most important divisions of the vast American chemical industry which excites the envy of the rest of the world. Last year the American fertilizer industry did a business of close to a billion dollars. By 1965, it is predicted, our industry will be doing close to two billion dollars annually. As might be expected, we are witness also to a new concept of fertilizer use: *fertilizer is regarded no longer as a quick stimulant for bigger yields; we recognize now that our product is a bulwark of permanent soil building and an indispensable tool in reducing the crop unit cost of production on modern, mechanized farms.*

Dr. Sauchelli's discussion was presented at the Pacific Northwest Plant Food Association conference June 30, July 1 and 2, at Pullman, Washington. *(Story page 26.)*

Dr. Vincent Sauchelli

Practices Then and Now

The fertilizer industry serves agriculture and it is inevitable that developments in agriculture will strongly influence our industry. In the period prior to chemical fertilizer manufacture, guanos, farm manures and by-products of the packing and other industries were generally used as plant foods—bulky organic substances like stable manure, fish meal, dried blood, composts and sewage sludge.

Factory made fertilizers were dubbed "synthetic" or chemical salts, and even though derived from natural materials were at first regarded by farmers with suspicion, prejudice and even contempt. This was understandable. Manures and guanos had been used for generations and were traditionally accepted. Fertilizers are strictly modern and, surprisingly, even at this late day, many farmers have never used them.

Bitter controversies were engendered at first in connection with their use which seem to us now as having been so futile and unnecessary. But 19th century scientists were doughty warriors who loved a fight and many a battle royal was fought. Eventually, the Rothamsted Experiment Station in England and similar agricultural research institutions in Germany, France and the United States demonstrated the value of so-called artificial or chemical fertilizers in the profitable production of crops, and peaceful development followed.

However, even today the argument started by Liebig three generations ago that chemical fertilizers can furnish plants all the nutrients they need is kept alive by the "organics only" cultists. These sincere but misguided proponents of "organics only" have never produced any acceptable evidence to justify their anti-fertilizer position.

It is extremely difficult to study experimentally the influence of plant nutrients on the nutritive value of a food and it is necessary to use the most carefully designed experiments to yield acceptable scientific results. This they have not done so far.

Population Increase

The pressure of increasing population in all civilized countries and the unquestionable utility of chem-

ical fertilizers in producing abundance of foods and fibers as demonstrated by American agriculture during the last war, however, have made many converts. All countries are in the process of expanding their domestic facilities for producing one or more fertilizer materials.

Educating Farmers

Farmers everywhere are being taught how to use more lime and fertilizers efficiently by proper placement, better adapted ratios and good soil management practices. The industrialization of the farm is demanding fertilizers of higher analysis and the improved drillability and storability qualities of granulated products.

Youth in the fertilizer industry of today can hardly appreciate the degree to which improvements in quality have been made. The sulfate of ammonia of yesteryear was almost always moist and liable to lump or cake, its free acid rotted bags, corroded wooden or concrete floors and its tar acid impurities made it smelly.

Superphosphate used to be produced as a moist material averaging only about 12 to 14 per cent P_2O_5. Prior to the use of mechanical dens a trip to the superphosphate plant was a most unpleasant experience—the fumes and dust were appalling. The potash salts have always been somewhat better in condition but the original low-grade manure salts often gave trouble when compounded with other chemicals.

Standardization of analytical methods and the sale of fertilizers on a guaranteed basis were major improvements in the marketing of our products. Sales practices of the early days of the industry reputedly were on a low level. Many unscrupulous little peddlers sold mixtures on an unethical basis and this gave the whole industry a bad reputation.

Fertilizer people generally were regarded as rogues or crooks. That is why so many of the agricultural authorities of that period recommended that farmers buy their materials by analysis from reputable firms and mix their own fertilizers on the farm.

The enactment of fertilizer control laws by states had a wholesome effect on selling practices. Another significant factor in elevating the ethics and practices of the industry was undoubtedly the entrance into it of men of higher moral stature and capabilities. This occurred when many of the smaller units became merged into large progressive enterprises. These larger corporations could afford to employ able executives, chemists, chemical engineers and other trained technicians. From then on technological progress modified the character of the old-time scavenger industry.

Since World War I the American chemical industry has advanced by big strides. We see how this influenced our industry:—the remarkable development of the synthetic nitrogen industry, our domestic potash industry, technological changes in the ancient superphosphate industry, physical improvements in such materials as sulfate of ammonia and imported nitrate of soda and the utilization of ammonia liquors of high nitrogen content which displaced low-analysis, uneconomical organic materials in mixed goods. When one considers the inertia which had to be overcome in the old tradition-ridden fertilizer and agricultural industries to get these innovations accepted, the progress since 1915 is truly marvelous.

Because phosphorus is the major part of my subject, a brief review of some of the highlights of its history is pertinent. Discovered accidentally in the 17th century by the alchemist Brandt in Germany, phosphorus was destined to become one of the most remarkable discoveries of all time. This chance discovery was transformed by slow, steady progress by the alchemy of vision, enterprise and sweat, into one of the primary materials for the advancement of agriculture, the improvement of private and public health and the enjoyment of human life.

It is impossible to conceive of modern civilization in the absence of phosphorus. That's how vital it is.

Early History

We owe gratitude to the pioneers who founded our industry and who patiently toiled to advance its interests—von Liebig in Germany, Gilbert and Lawes in England,

Boussingault in France, William Davison, Gustavus Ober, John Kettlewell in Baltimore, Md. —scientists and industrialists—and the thousands of unsung, unremembered persons who made their small but worthy contributions.

In the United States, commercial developments began with the discovery of phosphate rock deposits in South Carolina in 1867 and subsequent discovery and exploitation of the rich deposits of Florida and Tennessee.

World agriculture as well as domestic responded quickly to the availability of this essential plant nutrient. By 1900 approximately 80 companies were mining phosphate rock in Florida alone. In the last year of record—1951—world production of phosphate rock amounted to 23.7 million tons with approximately eight million tons of P_2O_5 and world production of superphosphate reached the grand total of 27.4 million tons (about five million tons P_2O_5) of which the United States alone produced 30 per cent or close to 1.5 million tons P_2O_5.

Early Growth Slow

The growth of the fertilizer industry had been relatively slow during its first 100 years. The pattern which developed in the early stages persisted until recently with but little change. Several of the larger fertilizer companies mined and beneficiated raw rock phosphate in Florida and Tennessee. These subsidiaries or mining divisions of the big companies furnished prepared ground rock to their parent companies and offered some for sale on the open market.

Fertilizer companies, with one or two exceptions, manufactured superphosphate as the only fertilizer ingredient. Most of the large companies produced in coexistent plants all the sulfuric acid they needed, but the majority of the processors bought both rock and acid in the open market, while the dry mixers bought superphosphate from larger producers. Most fertilizer companies bought their requirements of the other major plant foods—nitrogen and potash—from prime producers and dry-mixed them with the superphosphate to produce complete mixed fertilizers. That, in general, was for years the broad pattern and organization of the fertilizer industry.

Technological Culture

In today's technological civilization it seems to be the rule that search never ends for new and physical inventions. It is necessary to do this if one is to survive. The basic rule of this present-day culture is to use energy more efficiently. Mechanization becomes the order of the day. Ours is the machine and chemical age. You know how one major material invention can produce multiple effects.

A good example is the invention of the internal combustion engine and its use in the automobile—a constellation of inventions and integrated developments throughout our social life is associated with that one invention. Similarly a cluster of associated inventions and developments in agriculture and the processing industries stemmed from developments in the rock mining industry.

Muscle—human and animal—was the power used in rock mining in the primitive years in Florida and South Carolina—back-breaking work with pick and shovel, wheelbarrow and mule. That same kind of power prevailed in the fertilizer plants, too.

What a contrast today: giant draglines, equipped with booms 170 feet long and buckets of 16 cubic yards capacity which can remove 10 tons of overburden every 45 seconds of operating time —1500 tons an hour! And only three men required on a dragline per shift. To do the same work by the old muscle and steam shovel method required 40 men.

Beneficiation of the rock by flotation is another improvement in the achievement of low-cost operation. By its means the miner can recover phosphate rock fines of less than 20-mesh size—fines which comprise about 20 per cent of the total phosphate of lower grade rock of the pebble field of Florida (66 to 68 per cent B. P. L.) and up to about 85 per cent of the higher grades.

Thus millions of tons of phosphate formerly discarded are now recoverable. That represents real conservation of a priceless national resource.

What is true of the mining is true also of the processing phase of the industry. Technological progress in Europe and America has raised the general efficiency of plant operations, increased the total available P_2O_5 content and improved the physical quality of normal superphosphate.

This product has been the basis of the world commercial fertilizer industry for more than a hundred years and is still the premier source of phosphoric acid for plant feeding purposes.

The process originated in England when John Lawes commercialized Liebig's suggestion that treating a mineral phosphate with acid converted it into a more rapidly available phosphate for plant growth. Lawes called the product Super-Phosphate and that designation has been used ever since.

Held First Rank

This "wet" method of producing superphosphate has held first rank for over a century because of its simplicity and low-cost operation. Alternative methods are now receiving serious consideration in our country because of the threatened shortages of cheap sources of brimstone sulfur.

The industry can take justifiable pride in its record of having improved manufacturing methods which gradually increased the available P_2O_5 content from 12 per cent to the present average of between 18 and 21 per cent available P_2O_5. These are evidence of the improvements in the industry brought about by mechanization and chemical engineering. Technological advances gave us granulation as a dependable means of improving physical quality and storability.

The present capacity of the more than 204 plants in the United States for production of normal grades of super is close to 16 million tons (or about three million tons available P_2O_5) and of the nine plants for concentrated grades, 45 per cent to 48 per cent P_2O_5, the national capacity is about 800,000 tons (approximately 360,000 tons P_2O_5).

The demand for concentrated superphosphates is rapidly expanding, particularly in the Middle West and Pacific Regions. Industry is aware of this as is evidenced by the new capacity which has been

completed recently or is at present under construction in Florida and elsewhere.

The trend toward mechanization and chemical engineering in all industry is reflected in the design and operation of modern superphosphate and fertilizer plants throughout the world. Mechanical dens for batch and continuous operation are now the general rule. Man-labor hours per ton of superphosphate have declined significantly while quality and quantity are maintained at high levels.

The threatened early depletion of the sulfur domes of the Gulf states, which alarmed many persons two years ago, had the effect of directing interest toward processes for calcining or fusing phosphates and processes that utilize nitric and phosphoric acids, alone or as mixtures.

Europeans for many years have been acidulating phosphate rock with mixtures of nitric and sulfuric acids as a means of overcoming the high cost of imported sulfur. It is reasonable to expect that our domestic industry will in the near future utilize some of these alternative processes found suitable to our economy.

Undoubtedly, we shall have in the not too distant future commercial fertilizer materials of high nutrient content which now are known only to laboratory workers. For example, such promising products as potassium metaphosphate and magnesium ammonium phosphate. It is conceivable that low-cost electrical power may make it possible to produce the element phosphorus here in the Northwest for shipment to eastern processing centers where it will be made into required phosphatic compounds for industry and agriculture.

Fascinating Future

The future appears so fascinating, but who dares to prophesy? Of one thing we can be sure: it will be different. Change is inevitable and we can face it with courage and hope.

The fertilizer industry and agriculture constitute a close business partnership: no closer business partnership exists. The farmer's problems are the industry's problems. We depend on the farmers for our income. His purchasing power tells us the extent to which he may buy what our industry produces.

To meet the demand of an expanding, scientific agriculture, industry has developed new and revamped old processes and techniques. Some of the novel developments are, for example: the direct application of anhydrous ammonia to soil; bulk spreading of superphosphate first and now complete fertilizers; spray-feeding through foliage; application of fertilizers by airplane; direct application of concentrated fertilizer solutions; use of pressure tanks for anhydrous ammonia application and non-corrosive tanks for ammonia solutions and improved, moisture-proof bags.

Powerful Factors

Progress in the science of nutrition of plants and humans, the economic evaluation of balanced fertilizers based on agrobiologic sciences, new varieties of plants capable of utilizing much higher quantities of plant food than previous types—these are some of the powerful factors favoring an increase in consumption of high-analysis, chemical fertilizers.

These ferments in agriculture and the fertilizer industry are creating pressures within and without which demand action by our leaders if they want to safeguard or improve their position. Something new has now been added: the federal government through its Department of Agriculture agencies is prodding the industry to expand its facilities and urging cooperation of state agricultural agencies to meet the future requirements of our vigorously growing population.

You are all familiar with the production goals set up by the United States Department of Agriculture for plant nutrient production by 1955: an over-all increase of 79 per cent, or in round numbers, an increase of total nutrients to 7,855,000 tons. That certainly is asking us to raise our sights as never before. Our government is becoming our best salesman. Could any industry hope for more?

One may ask, in looking at this rosy picture of future prospects, "What can hold us back?" Well, ourselves, principally, by how far we are willing and able to progress in the production, merchandising and scientific research phases of our industry.

We must realize that progress will be achieved by team-work, by integrating our efforts with those of other agencies, hoth governmental and private. These efforts will be focused on convincing the farmers of America that fertilizer is an indispensable tool in farm production for reducing the crop unit cost of production.

Under the spur of necessity, we have already tasted some of the fruits of this teamwork. How else can we explain the remarkable increase in production and consumption of fertilizers during the past decade or so?—an increase from about eight million tons in 1939 to 22 million tons in 1952. Chemistry, biology, engineering and managerial skills on the farm, in the laboratory, in the factory and in the market made this record achievement possible.

In this past period of accomplishment we see how new, concentrated nitrogen solutions derived from synthetic ammonia were blended successfully with highly purified, concentrated potash salts, higher analysis phosphates, difficult-to-handle solid ammoniates of 32 to 45 per cent nitrogen content to produce acceptable concentrated mixed fertilizers. Much work had to be expended by production men in learning how to adapt these new materials to their purposes, and by the agronomist and plant breeder, to theirs.

We have a great deal yet to learn. That's what makes our own cluster of industries so interesting—ever changing, ever challenging the best in us. The new and broader concept of the role of fertilizer in farm practices and in the national economy will keep on generating demand for our products—a demand influenced more by the needs of nutrition, sound farm practices and national security than as, in the past, by the size of the previous year's cash-farm income.

Public Concern

The leadership and managerial skill of the fertilizer industry now face this challenge of a greater public concern for the future of our soils and of public health. Never in its long years of service to agri-

(Continued on page 71)

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Contains 6½% nitrate nitrogen — quick acting for early, vigorous growth. Contains 19½% ammonia nitrogen — slower acting for sustained growth through to harvest time.

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Spencer Chemical Co. shows grass control with CIPC on E. F. Nunn plantation, Shuqualak, Miss., six weeks after the treatment. Field had been flooded twice.

Spencer, Monsanto, Columbia - Southern, U. S. I. report tests with new herbicide:

'Results border on the spectacular' with

Chloro-IPC

Farm Chemicals
Staff Report

RESULTS border on the spectacular." That's the comment Otto L. Hoffmann, plant physiologist for Spencer Chemical Co. made last month in reviewing the use of the herbicide Chloro-IPC during 1952 and the early months of 1953.

A steadily growing market for the weed killer, which now is being manufactured by several farm chemicals companies, is indicated by successful control of weeds in cotton fields under a wide variety of climatic and soil conditions, according to Hoffmann.

"With few exceptions," he stated, "farmers who used CIPC this year said they would use more next year."

CIPC, chemically known as isopropyl N-(3-chlorophenyl) carbamate, is a close relative of IPC, another herbicide developed several years ago. Like IPC, the newer weed killer primarily is a preemergence herbicide.

Present manufacturers include Columbia - Southern Chemical Corp., U. S. Industrial Chemicals Co. and Monsanto Chemical Co.

W. P. Marsh Jr., president of U.S.I., is so impressed with the outlook for CIPC that he stated recently "Not since the recognition of DDT as an insecticide material has there been such an emphasis placed on the possibilities of a chemical as there has been on CIPC in its role as a weed killer.

Sociological Significance

"In the South," he continued, "particularly in the cotton area, which has suffered greatly from migration to the North and West, CIPC has gained sociological significance."

With IPC, he stated, the herbicide almost certainly represents "the last major step in the complete mechanization of cotton culture."

Results of tests with Chloro-IPC and IPC can be seen in the Monsanto photographs on page 24. A representative of the company told FARM CHEMICALS "combinations of Chloro-IPC or IPC with Santobrite, Monsanto's sodium pentachlorophenate, look much better than any of the chemicals alone from an economic standpoint."

This is indicated in the fourth Monsanto photo, showing results of spraying at the rate of three pounds of IPC and six pounds of Santobrite per acre.

Atlas Powder Co. also is in the CIPC picture. The company now is marketing an emulsifier called ATLOX 2081, which it says is being used in all the well-known emulsifiable CIPC formulations.

E. D. Witman, manager of agricultural development at Columbia-Southern, who has done exhaustive research on the weed killer, confirmed the optimistic reports from the cotton country.

His company states that the

herbicidal effects of the chemical last approximately four to six weeks in the soil. Columbia-Southern thinks soil temperature is the most important factor in CIPC effectiveness, with rainfall secondary.

Both pre-emergent and post-emergent applications have been successful, according to the company, but the important thing to remember is that CIPC should be present in the soil at germination or in the very early seedling stage of the weeds to be successful.

The report from Hoffmann at Spencer is an excellent discussion of CIPC—from the economic as well as the chemical standpoint. The text follows:

Hoffmann's Report

Results border on the spectacular. Weed control costs were reduced on some plantations in the Mississippi Delta by as much as $25 per acre. During the wet season this spring, many treated fields were saved, while adjacent, untreated fields were overrun with weeds and had to be replanted.

On one farm, three hoe hands did all the required hoeing on 80 acres of treated cotton. A farmer in the Bootheel saved $3,000 in weed control costs on 200 acres treated with CIPC, compared with 200 acres of untreated crop. In many instances CIPC gave good weed control for at least four weeks where the rainfall was 20 or more inches after treatment.

In addition to weed control, treated cotton frequently grows more vigorously. Seedlings emerge in clean bands and can make better use of fertilizer and moisture. Also, where CIPC is used the cultivator must be adjusted to maintain an undisturbed treated band to prevent the introduction of weed seed. This setting results in less root pruning.

The experience of Harrison Evans, president of the E. F. Nunn Company, Shuqualak, Mississippi, illustrates the benefits to be obtained from CIPC.

Cotton was planted and treated in overflow land in the middle of April. The rains came. Before tractors could get into the field on June 3, the field was under water twice and had received over 20 inches of rain. Grass was in the rows, but it was young and the cotton was four to six inches taller than the grass.

Another Spencer photo shows appearance of Nunn field a month later, after grass had been hoed out. Grassy cotton normally would be replanted.

Savings in hoeing costs amounted to $11 per acre in this treated field on the J. H. Garmon plantation, Clarksdale, Miss., when CIPC was used.

Two cultivations and oilings and one light hoeing, at a cost of $2 per acre, cleaned the grass out of this field. At first glance, control did not appear to be exceptional—until one examined a small area of untreated cotton where the sprayer ran out of solution. Here it was difficult to see the cotton in the grass. Replanting would have been necessary if the whole field were untreated. Hoeing could not save this cotton. With CIPC, Evans saved his cotton and reduced labor requirements and costs substantially. The cotton grew off to a vigorous start which should mean additional returns when the crop is picked.

Common Weeds Controlled

The degree of weed control that can be obtained with a herbicide is frequently limited by crop tolerance. Fortunately, cotton is one of the crops least susceptible to CIPC damage. So rates that will kill most annual grassy and broad-

1. Monsanto Chemical Co. photo, made on West Coast March 11 this year, as were others, shows a check plot of Calpack figs used in tests with IPC, CIPC.

2. Result of applying six pounds of IPC per acre. Compare results with photo of Chloro-IPC test below.

3. As can be seen by comparing this photo with 2, above, CIPC does a better job of control than IPC.

4. Using six pounds of Santobrite with three pounds of IPC, Monsanto obtained excellent results below.

leaved weeds can be used. Annual grassy weeds are very easy to control, as are a few broad-leaved species, such as purslane and chickweed. Other broad-leaved weeds, such as pigweed and morning glory, usually are controlled, but are missed occasionally. Resistant weeds at rates tolerated by cotton include ragweed, cocklebur, coffee weed, and most perennial weeds. Unless the resistant weeds normally constitute the entire weed population, CIPC will be useful.

Seldom will it fail to control crabgrass and other annual grasses that are responsible for the largest share of the hoe bill. Fields with solid stands of cocklebur benefit little from CIPC treatment, but where scattered patches of Johnson grass occur, treatment greatly reduces the hoe bill. CIPC does not eliminate hoe labor, but it should reduce hoeing to a few light roguings.

A frequent experience in the use of CIPC is that weeds emerge along with the cotton. Growers who examine their fields at this stage are disappointed. It is difficult to console them, since control does fail occasionally. The more usual experience is that the weeds die in a week or ten days after emergence.

Band Application

CIPC is used at overall rates of six to nine pounds per acre. To reduce the cotton planter's application cost, 12-inch bands centered over the rows are sprayed. This reduces the actual chemical consumption to two to three pounds per acre. The two-pound rate is used on lighter soils and the three-pound rate on heavier soils. Other factors in addition to soil texture which influence effectiveness are soil temperature, fertility, organic matter and weed population. Where these factors are much different from average, an adjustment of one-half to one pound in the application rate will give better results.

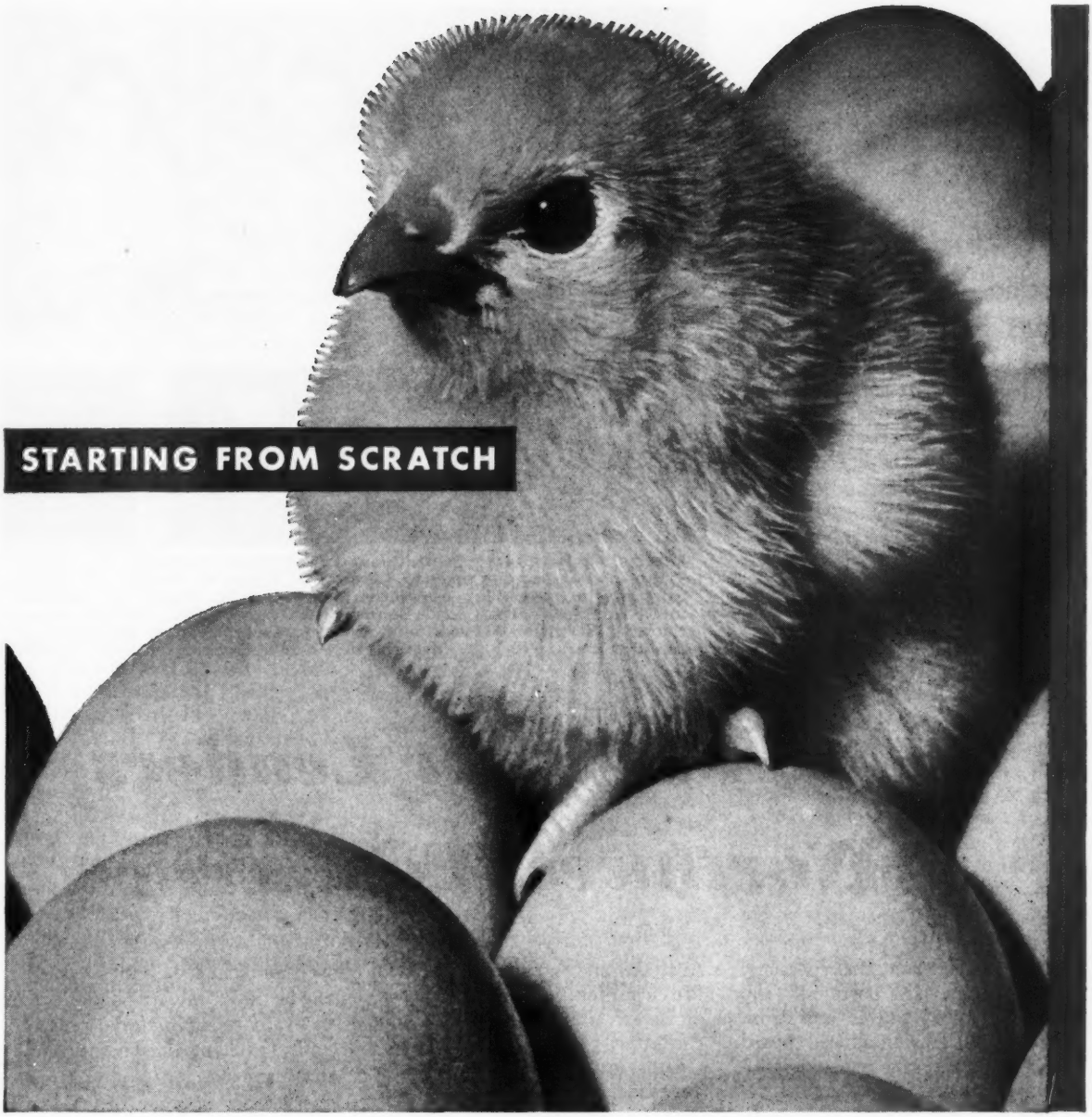
For example, coarse sands low in organic matter and clay content require one and a half pounds per acre, whereas clays high in organic matter may require four pounds per acre.

Many different application methods will give good results. The most economical is the one-operation method. With this method: (1) the beds are prepared with a cultivator mounted in front of the tractor, (2) the beds are leveled to the same height and smoothed with runner wings attached to the sword openers, (3) seed is hill dropped to stand, (4) the bed is rolled to produce a smooth, firm surface and (5) CIPC is applied.

Some growers prefer to perform one or more of these operations separately to speed up planting or reduce the complexity of the machinery.

Fails in Dry Ground

CIPC requires soil moisture to become effective. A light sprinkle or even a heavy dew may be sufficient to activate the chemical. Failures in weed control have occurred where CIPC was sprayed on dry ground and no rain followed application. This characteristic has limited the usefulness to the more humid section of the country. In the drier area, mixing with the top half inch has increased effectiveness in experimental plots. ◆



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While man supplies labor and knowledge, it's the soil that supplies the strength responsible for the growth of all living things. For from the soil come the vital plant-food elements that nourish all life. And to the soil these elements must be returned.

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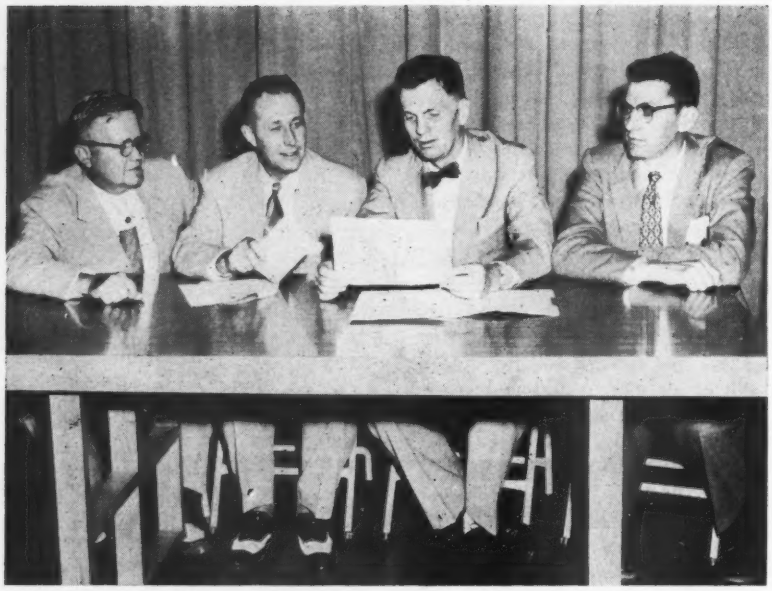
Pacific Northwest plant food group has varied talks



Leaders of fertilizer organizations get together at Pacific Northwest Plant Food Association meeting. From left, Ernest W. Hansen, vice president of the sponsoring association; Dr. John R. Taylor Jr., agronomist, American Plant Food Council; W. R. Allstetter, vice president, National Fertilizer Association and F. T. Tremblay, soil improvement committee of the PNPFA. Meetings were held at Washington State College.

Many Fertilizer Leaders At Northwest Conference

MORE than 300 persons, from all parts of the United States and from Canada and Hawaii as well, heard discussions on every phase of fertilization at the fourth annual regional fertilizer conference sponsored by the Pacific Northwest Plant Food Association.

The meeting was held at Washington State College, at Pullman, June 30, July 1 and 2.

Most of the persons participating in the conference represented either fertilizer companies in the northwest area or colleges and experiment stations, but delegates from many other states belied the "regional" nature of the sessions.

Associations Represented

Both of the national fertilizer trade organizations, National Fertilizer Association and American Plant Food Council, were represented, Vice President W. R. Allstetter and Agronomist Malcolm McVickar for the former and Agronomist Dr. John R. Taylor Jr., for the latter.

Other important leaders in attendance included Dr. George Scarseth, American Farm Research Association, Dr. Eric Winters, TVA and Dr. Vincent Sauchelli, Davison Chemical Corp. (*Dr. Sauchelli's talk on "Phosphate, Fertilizer and Agriculture," is printed in full on page 15 in this issue.*)

The conference was sponsored by the soil improvement committee of the association, in cooperation with agricultural colleges and universities in the Pacific Northwest.

The program was designed to present pertinent facts recently gleaned from research with plant nutrients in the area.

Industry Members

Scientists, extension and Soil Conservation Service specialists as well as techicians and salesmen in the fertilizer industry had a chance to evaluate the material presented and to exchange viewpoints on new developments.

Excerpts of some of the talks given at the conference which should be of interest to fertilizer manufacturers in all parts of the country follow:

Economic Aspects of Fertilizer Recommendations—*W. R. Allstetter, vice president, National Fertilizer Association.*

Farmers of the Northwest can maintain or increase their net income in the face of declining prices simply by using present knowledge to step up yields. If they are to continue to prosper under the current unfavorable farm market situation, it is essential that they do just that.

Farmers, under present price relationships, could, through fertilizer applications, increase their income by the following amounts: wheat—$10.93 per acre, potatoes—$122, alfalfa—$7.75, pastures—$65.67 and field corn—$84.

Stepping up yields through proper fertilizer use will cut unit costs of production. This enables farmers to compete profitably for markets even if farm prices are not as favorable as they should be.

Fertilizer recommendations to farmers should be designed to bring about maximum income per acre. Farmers want and need to know just how much and what kind of fertilizers are necessary to maximize profits. Agricultural authorities and the fertilizer industry must intensify their interests to furnish farmers with this needed information.

Report on Grassland Farming, First Year's Results of the Farm Improvement Plan. The Benedict Farm—*LaVern M. Freimann, County Extension Agent, Bellingham, Wash.*

The Benedict Demonstration Farm in Whatcom County grew out of the resolution of the Soil Improvement Committee of the Pacific Northwest Plant Food Association to help sell the USDA's Grassland Farming Program. A subcommitttee spearheaded by Todd Tremblay and George Wickstrom reasoned that it would be a good idea to see how well the pasture seeding, fertilizing, irrigation and management recommendations of Washington State College, when all were applied to a given farm, would really pay off.

They felt that too often when a recommendation is followed, the related recommendations are ignored. Hence the benefits are limited.

Through their efforts, fertilizer was made available by the Pacific Northwest Plant Food Association, seed was donated by the Charles H. Lilly Co. and the Farmers Equipment Co. of Lynden provided the irrigation system at two-thirds cost. After surveying the area, we selected the Benedict Farm near Bellingham to serve as the demonstration farm where all these ideas would be put to work.

In the first year, 1952, seemingly miracles began to happen. Instead of having to buy hay to supplement the pasture as in previous years, the Benedicts had more pasture than their herd could eat. The carrying capacity was quadrupled. Likewise, the grazing season was stretched out over nearly twice as long a period.

The results this year promise to become even more spectacular. The benefits on the Benedict Farm from a well coordinated seeding, fertilizing and irrigated pasture program under proper grazing management demonstrate that the sum of the results from such an intergrated program greatly exceed the benefits from each of the recommended practices used alone. Seeing is believing. One thousand people saw last year, and now know we have barely scratched the surface on the possibilities of grassland farming. Recently, 100 dairy farmers from Canada came to see the farm.

In addition to demonstrating the principles of grassland farming, the plan has demonstrated a method of education in which industry, local business groups, educational organizations and a cooperative couple, such as the Benedicts, can work together to put into wider usage practices which are the fruits of our agricultural research.

Chemical Soil Aggregate Stabilizing Agents and Moisture Flow and Retention—*Walter H. Gardner, soil scientist, Department of Agronomy, Washington State College.*

Some of the new chemical soil aggregate stabilizing agents (soil conditioners) have a pronounced effect on the flow and retention of water in the soil. This effect of these materials on the physical properties of the soil has an important bearing on soil erosion and other practical problems.

Soil conditioner-treated plots on the Erosion Farm at Pullman show a very marked reduction in erosion and run-off. Quantitative evaluation of the effect of soil conditioners on moisture flow and retention has been made in the laboratory and a technique for evaluating soil conditioners with regard to such physical properties was described. Slides and demonstrations illustrating the effect of soil conditioners on the physical properties of the soil were shown.

Synthetic Soils Aggregate Stabilizers for Oregon—*R. A. Pendleton, Soils Dept., Oregon State College.*

Several synthetic soil aggregate stabilizers have been tried on a few of the Oregon soils.

Although use of these amendments in western Oregon soils has resulted in a considerable increase in the percentage of the larger sized aggregates, and thus improved the workability or apparent tilth of the soil, there has been no corresponding improvement in crop growth. Trials have been made with pasture

Todd Tremblay, second from left, new chairman of the soil improvement committee of PNPFA, gets briefing at meeting. In discussion are, from left, Norman Hibbert, Anaconda Copper, vice chairman; Tremblay; Past Chairman George Wickstrom, Northwest representative of the American Potash Institute; G. O. Baker, soil scientist, University of Idaho and H. B. Cheney, head of the soils department, Oregon State College.

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grass mixtures, lawns, certain garden crops and sugar beets.

Most soils of western Oregon that have been tested have approximately 10 per cent or more non-capillary porosity, which is considered by many investigators sufficient for most crops. Under this situation, increased granulation might not be expected to improve growth. The materials were all applied by some type of rotary tillage machine, an operation which in itself will increase porosity and improve tilth in the treated zone. This effect has been shown to persist for at least one year in a Chehalis sandy loam soil.

On an alkaline soil of eastern Oregon results have been quite different. One such soil which in natural condition was highly dispersed and nearly impervious to water, was greatly improved in granulation and tilth. Irrigation water moved laterally to meet between furrows in two hours' time in the treated soil, whereas in untreated soil very little lateral movement was observed in nine hours.

In Oregon present indications are that these materials have two possible places of use: (1) they may prove of considerable value in alkali soil reclamation and (2) they may be of interest to home gardeners who wish to condition their soil for easier working even though no better plant growth results. Other studies may develop further uses.

To date the most effective material has been a VAMA product. Second best have been preparations of HPAN, of which several have been tried. Two samples of CMC and two of organic materials have been of little value in these trials.

The Columbia Basin in 1975—*A. H. Harrington, chairman, Dept. of Agricultural Economics, Washington State College.*

By 1975 the nearly 600,000 acres of land now scheduled for irrigation in the Columbia Basin Project should be well developed. Half of this acreage probably will be in hay and pasture. Another 100,000 acres are anticipated to be in small grains and field corn. Some 85,000 acres of dry beans, potatoes, onions and sugar beets, nearly 40,000 acres in truck crops and nearly 40,000 acres in fruit are anticipated.

Fertilizer usage is being estimated as well as the effects of this agricultural development on the population and other business in the area.

New Wilson Compton Union Building at Washington State College, Pullman, where fertilizer representatives met for fourth annual conference.

Movement of Nitrogen Fertilizers in the Soil—*Robert L. Hausenbuiller, assistant soil scientist, Irrigation Experiment Station, Prosser, Wash.*

Significant losses in farm income is the all-too-frequent result of improper use of nitrogen-fertilizer materials. Greater efficiency in their use can be attained through the understanding and application of a few relatively simple facts about nitrogen fertilizers. Important among these are those facts dealing with the movement of different forms of nitrogen in the soil.

The forms of nitrogen used most frequently as fertilizers are nitrate and ammonium. The ammonium form is distinct in that it is held tightly by soil particles and is not moved about by soil water. In time, however, the ammonium form is converted to nitrate. In this state it will move freely in the soil and as dictated by the movement of soil moisture.

The nitrate form can be carried to plant roots, thus enhancing its availability. In addition, however, all nitrate-nitrogen is subject to loss by leaching. This loss can be serious in the case of fall-applied nitrogen in the more humid areas of the Pacific Northwest or where over-irrigation is practiced.

The freedom with which ammonium hydroxide (aqueous or gaseous ammonia) moves is dependent upon the soil. In very sandy soils its movement by soil water is rather unrestricted. It may be leached to a considerable extent from alkaline soils by relatively heavy additions of water. In acid soils, on the other hand, this form of nitrogen becomes rigidly fixed against further movement until it has been converted into the mobile, nitrate form.

As serious as leaching losses are those resulting from failure to get the fertilizer down to a level in the soil where it is available to plants.

Liquid Fertilizers: Properties and Potentialities—*R. L. Luckhardt, manager, Fertilizer Division, Agriform Co., Inc.*

Very little is known by the general public about the use of plant food in liquid formulations for large scale agricultural use. This is true in spite of the expanding use of liquid fertilizers. For instance, farm equipment manufacturers have not yet provided much machinery for liquid fertilizer application and should become acquainted with the subject.

Liquid fertilizers for home garden use have been high priced and led many to believe this was true for field use, whereas, the reverse is now true. Articles in trade publications concerning liquid fertiliz-

(Continued on page 72)

Diamond overcomes obstacles . . .

They Battle Budworms, Snakes and Wilderness

A. L. Geisinger
Vice President

By Hamilton C. Carson
Managing Editor

THE story of how Diamond Alkali Organic Chemicals Division rushed 200,000 gallons of a special DDT formulation to Canada last year to battle the spruce budworm is one of the most dramatic in the farm chemicals industry.

Company Growth Also Dramatic

But the development of the company and its rapid expansion, while not so widely publicized, has been just as dramatic.

For instance, the manner in which the organization constructed a BHC plant near Houston, Tex., after hewing out a forest in an area that was "alive with rattle snakes and water moccasins."

Actually, the story of the spruce budworm battle, which dramatized the value of pesticides last year, was far surpassed a few months ago when Diamond completed shipment of more than a million gallons of the DDT formulation for a second application in the Canadian forests.

In fact J. G. Brunton, vice president in charge of sales for the division (formerly Kolker Chemical Works, Inc.), calls it "the largest single spray job in the world."

But by this time it's old stuff to the staff of the Organic Chemicals Division.

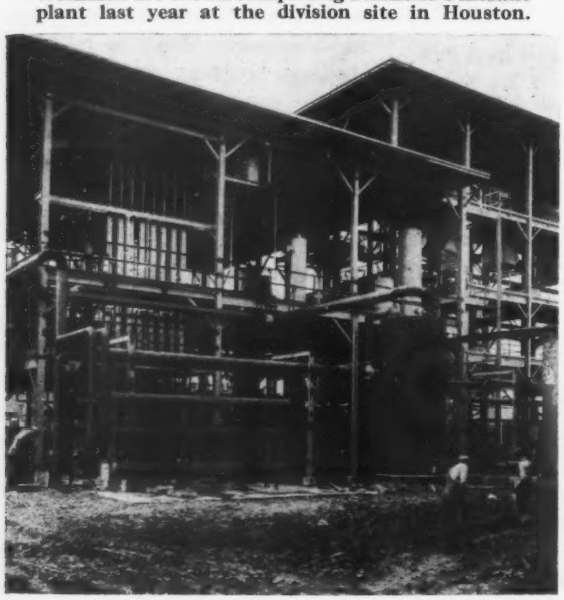
The most amazing fact about the budworm battle is the high degree of control attained by the airplane spray operations, considering the hastily made plans for the project.

According to Dr. R. E. Balch, head of the Dominion Entomological Laboratory at Fredericton, between 99.8 and 100 per cent of the budworms in sprayed areas were killed.

Diamond got into the project early in 1952 after the New Brunswick International Paper Co. and the Province of New Brunswick jointly developed a plan to protect valuable pulp forests in the province from the ravages of the worm, which had been on the increase for several years.

Not only was Diamond required to supply 200,000 gallons of the DDT spray, it had to be delivered at a rate of one railroad carload a day for 47 days and the material had to stand temperatures of 30–40 degrees below zero without deteriorating.

Workmen are shown completing Diamond's lindane plant last year at the division site in Houston.



Exact Schedule Met

The Newark, N. J. plant met the exacting schedule, with the pesticide being trucked 60 miles over hilly forest roads before spring thaws made travel impossible.

Meanwhile, a team of foresters, aviation experts and entomologists was being assembled in Canada to carry out the spray job.

There were many obstacles in addition to the complex scheduling and the rigid time table.

Spraying could be done only between sunrise and the time when wind and thermal activity forced shutdown—a period averaging three hours; and the job had to be completed during the three-week period in

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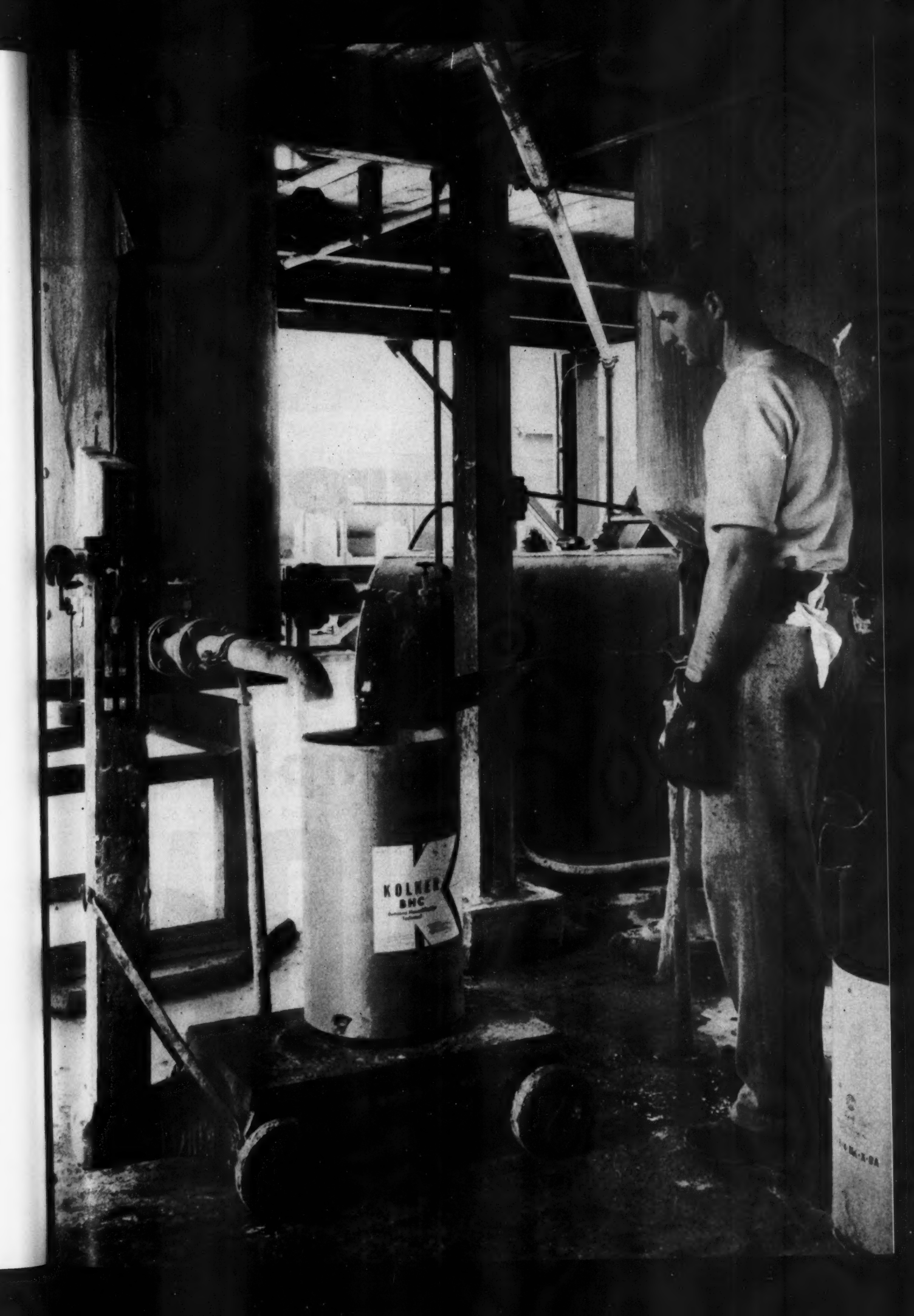
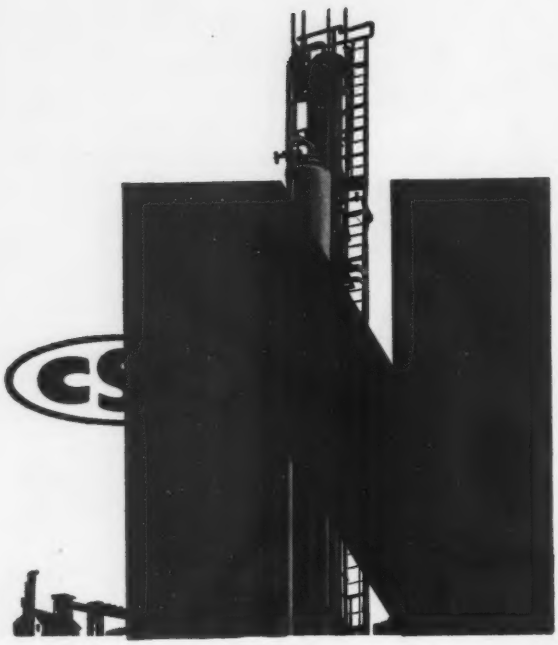
PHOTO ON OPPOSITE PAGE: Worker packages 36 per cent BHC dust at Diamond's Houston, Tex., plant.


KOLKER
BHC



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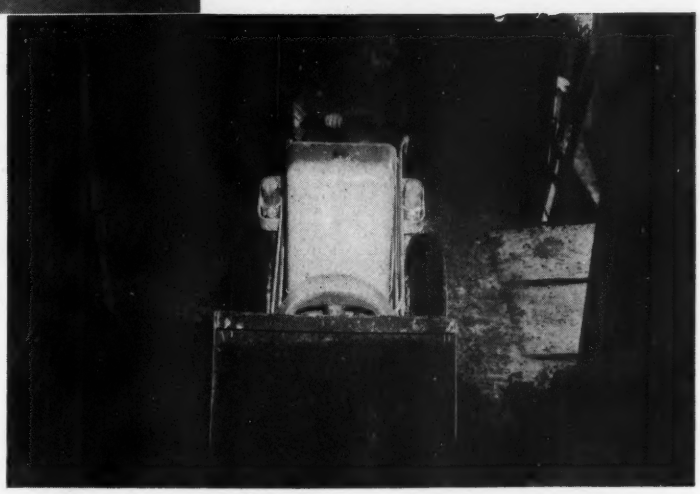

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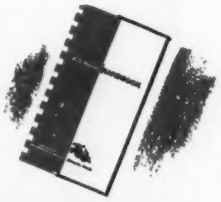

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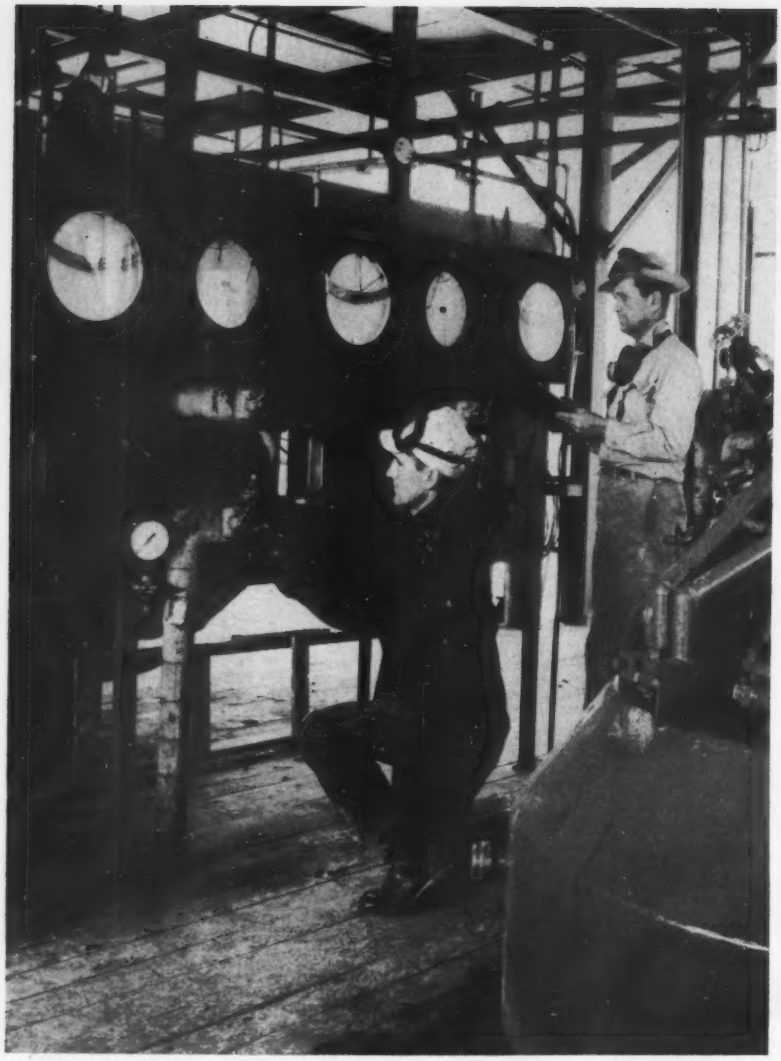

Technicians adjust controls at panel near reactors in Diamond Alkali Organic Chemicals Division benzene hexachloride plant in Houston, Tex.

Jack G. Brunton, vice president in charge of sales for division.

Rear view of BHC plant in Houston, showing pond with water for cooling.

which the worm is actively eating the new fir tree growth in the 300-square mile section.

The spray developed by Diamond contained one pound, per gallon, of actual DDT dissolved in a special solvent capable of withstanding extreme winter temperatures.

The successful project cost the sponsor approximately $2 an acre for the insecticide and the airplane application.

The story of the mammoth spraying operation, of course, is the first thing that comes to mind in describing the activities of Diamond Alkali Organic Chemicals Division, but it is by no means the only impressive side of the story.

The growth and expansion of Kolker and the scope of its operations also are noteworthy.

Subsidiary of Diamond

Today it is a wholly owned subsidiary of Diamond Alkali Corp., one of the largest producers of alkalies in the world. The acquisition was made in August, 1951, five years after the company was started in Newark.

Charles and Lee Kolker started the chemical works from scratch after being graduated from Massachusetts Institute of Technology with the degrees in chemical engineering.

Native New Yorkers, they started in 1946 "a small organization doing a large business."

According to Charles Kolker the company's one and one-half acres in Newark probably have the "highest per dollar per square foot production of farm chemicals in the world."

The company started with a DDT plant, followed with a 2,4-D pilot plant the same year and went into commercial production of the herbicide a year later.

In 1949, 2,4,5-T was added to Kolker's product list.

It was in 1950, a year after Brunton had joined the company, that Kolker considered large-scale expansion and turned its thoughts toward Houston, Tex.

Production Up Four-fold

Kolker had increased its production four-fold in its first four years and was looking for more room to operate.

Air view of Diamond's Houston works shows overall layout of BHC plant (by pool), DDT plant and other buildings used by the Organic Chemicals Division. Photo shows how company cut the site out of the wilderness.

Houston offered two big advantages: it is only a short shipping distance from most of the Cotton South and it is near a source of supply of benzol and chlorine.

With selection of Houston the battle against the rattle snakes started.

Brunton still recalls some of the blood-curdling tales of construction workers on the job.

But, despite the snakes and construction restrictions imposed by the Korean war, the plant was carved out of the Texas wilderness in little more than three months and put into operation October 23, 1950.

First unit at Houston was a BHC plant. A year later DDT facilities were constructed and lindane was added in 1952.

With the Texas operations, Kolker became the first producer of DDT in the Southwest.

Its ever-increasing product list (Diamond tries to add at least one new material every year) is one of the reasons for the division's success, according to Brunton. Other products at the Newark plant include hexachlorobenzene, a seed disinfectant especially effective against the stinking smut, and K-101, an acaricide.

Latest Addition: MCP

Newest product, developed at Diamond's general research laboratory in Painesville, O., is MCP, an herbicide that is effective against broad leafed annual weeds. It can be used in areas where oats, flax and barley are susceptible to injury from the use of 2,4-D.

Diamond is both a formulator and supplier of basic materials in the herbicide industry. Because many companies don't want the danger of contamination involved in the formulation of potent weed killers, Diamond has become a major formulator of the materials.

Another activity of the organization has been supplying large quantities of lindane from the Houston plant for use against DDT-resistant body lice in Korea.

Diamond Alkali's reason for entering the sprawling farm chemicals field through acquisition of Kolker was obvious: it is a large producer of basic raw materials required in the manufacture of organic farm chemicals.

Overall coordinator of the Organic Chemicals Division is A. L. Geisinger, Diamond Alkali vice president.

Brunton, a native of California and former sales manager with Pennsylvania Salt Manufacturing Co., supervises sales.

Curtis Succeeds Kolker

Charles Kolker, who retired June 1 to join his brother in an industrial chemical business, was succeeded by Henry Curtis, with headquarters at Houston, where most of the future development of the Division is scheduled to take place.

Other top personnel in the division include: Dr. L. Gordon Utter, in charge of technical service work; Albert F. Fuchs, assistant sales manager for the South; L. J. Polite, Jr., assistant sales manager, northern territory; H. E. Meadows, Southwest technical sales representative and C. L. Troph, Midwestern sales representative.

What's ahead for Diamond? You have to keep your thinking flexible in this farm chemicals industry, Brunton insists.

That attitude helps explain the spectacular growth of the farm chemicals company in seven years and gives a good indication that the years ahead will contain more of the same. ◆

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Superphosphate in '52:

Normal, concentrated up, wet-base goods down

STATISTICS released last month show that production of normal and concentrated superphosphate increased in 1952 over the previous year but that production of wet-base goods showed a drop.

The figures were reported by the Bureau of the Census, Industry Division, Chemicals Section. They summarize production, disposition and stocks for the three types of superphosphate for each month of the two years.

Annual figures for the products beginning with 1943, the first full year for which data for the present groupings were collected, also are included in the report.

Monthly statistics for 1952 shown in Table 2 contain revised figures which were received from reporting companies after publication of the current monthly releases. These data therefore, supersede those published in previous monthly releases.

Revised Data

Table 3 contains monthly revised data for 1951, based upon a special survey made at the request of the National Production Authority on Form NPAF-182, "Superphosphate, Manufacturer's Report on Production, Consumption, Shipments and Stocks, by Quarters in 1950, 1951 and First 6 months of 1952."

The statistics from this survey appeared in the Facts for Industry, Series MI9D.1-02 release, "Superphosphate, Production and Shipments by Class of Customer for the United States and for Divisions and States, 1952 season."

Statistics include data for all plants known to have facilities for superphosphate manufacture, including government-owned plants. All quantities are expressed in equivalent short tons of the indicated APA (available phosphoric acid) percentage content. The statistics pertain only to superphosphate as such, and include no data for superphosphate in dry-base or dry-mixed goods.

Adjusting Figures

Figures for receipts of materials, shipments, consumption and stocks relate only to plants which actually produce superphosphate. Cases in which book figures differ from actual physical inventory are covered under the heading "Book Adjustments," the amount of book excess being indicated by a minus sign (−) and the amount of book deficit by a plus sign (+). The use of this device makes possible a full accounting of all quantities of each type of superphosphate.

Table 1.--SUPERPHOSPHATE: PRODUCTION, DISPOSITION, AND STOCKS, BY YEARS, 1943-1952

(In short tons - 2,000 pounds)

Product and year	Supply					Disposition			
	Number of plants[1]	Stocks on hand, beginning of year	Production	Receipts at plant	Book adjustments	Total shipped or consumed by producing plants	Shipments	Used in producing plants	Stocks on hand, end of year
Normal - 18% A.P.A.									
1952	207	1,090,830	9,805,555	176,171	+46,855	9,843,144	4,860,254	4,982,890	1,276,267
1951*	208	1,056,234	9,493,472	141,724	+19,637	9,620,237	4,910,273	4,709,964	1,090,830
1950	200	[2]1,163,618	9,296,051	107,304	+80,786	9,591,525	5,065,101	4,526,424	1,056,234
1949	183	1,216,788	9,075,903	94,356	+30,623	9,278,298	4,845,175	4,433,123	[2]1,139,372
1948	179	856,382	9,319,697	123,151	+44,025	9,126,467	4,789,668	4,336,799	1,216,788
1947	165	646,278	9,292,677	112,580	+60,031	9,255,184	4,752,324	4,502,860	856,382
1946	161	808,027	7,847,591	109,543	+66,590	8,185,473	4,421,670	3,763,803	646,278
1945	159	794,778	7,372,104	131,643	+4,470	7,494,968	4,332,992	3,161,976	808,027
1944	157	790,310	6,692,368	87,044	+6,873	6,781,817	3,951,402	2,830,415	794,778
1943	153	1,008,139	6,294,665	81,919	+13,629	6,608,042	3,935,293	2,672,749	790,310
Concentrated - 45% A.P.A.									
1952	13	66,356	862,345	4,164	+1,986	847,741	833,583	14,158	87,110
1951	9	55,252	716,488	...	+493	705,877	696,274	9,603	66,356
1950	9	104,310	686,855	...	-4,166	731,747	718,925	12,822	55,252
1949	8	70,681	548,504	...	+6,090	520,965	496,975	23,990	104,310
1948	7	66,134	468,711	1,138	-869	464,433	443,951	20,482	70,681
1947	7	54,713	383,833	274	+2,015	374,701	363,598	11,103	66,134
1946	7	32,556	322,319	1,286	+8,519	309,967	302,448	7,519	54,713
1945	9	32,488	250,960	...	+1,284	252,176	249,562	2,614	32,556
1944	9	41,580	281,076	...	+1,128	291,296	288,548	2,748	32,488
1943	9	48,743	293,983	812	-1,017	300,941	299,461	1,480	41,580
Wet-base goods - 18% A.P.A.									
1952	7	17,972	68,919	...	-2,264	67,993	40,554	27,439	16,634
1951	7	18,404	75,885	...	+2,111	78,428	66,046	12,382	17,972
1950	7	20,430	61,894	5	+762	64,687	38,867	25,820	18,404
1949	6	14,203	60,673	248	-1,024	53,670	29,819	23,851	20,430
1948	7	18,235	61,496	10	-430	65,108	54,431	10,677	14,203
1947	7	13,616	62,453	387	-146	58,075	51,333	6,742	18,235
1946	7	15,577	47,949	...	+1,590	51,500	29,026	22,474	13,616
1945	7	13,106	39,015	...	-1,173	35,371	21,685	13,686	15,577
1944	7	16,078	46,848	...	-793	49,027	40,511	8,516	13,106
1943	7	8,047	43,553	1,727	+2,353	39,602	33,346	6,236	16,078

*Revised.
[1]Plant count based on December reports.
[2]Difference is due to the fact that beginning with January 1950, 11 additional plants were added to the survey.

Table 2.--SUPERPHOSPHATE: PRODUCTION, DISPOSITION, AND STOCKS, CLASSIFIED BY TYPE, IN THE UNITED STATES, 1952

(In short tons - 2,000 pounds)

Product and item	Total	January	February	March	April	May	June	July	August	September	October	November	December
NORMAL SUPERPHOSPHATE (Basis 18% A.P.A.)													
SUPPLY, TOTAL.....	...	1,933,092	2,005,464	1,994,802	1,844,314	1,659,591	1,630,023	1,777,165	1,952,104	1,992,564	2,071,180	1,942,494	1,963,554
Stocks on hand, beginning of month.....	...	1,090,830	1,119,358	1,033,209	886,831	752,657	841,462	1,021,884	1,164,084	1,237,266	1,216,803	1,188,075	1,185,307
Production.....	9,805,555	820,663	875,121	939,089	941,619	882,881	762,392	745,466	764,653	741,580	839,011	744,776	748,304
Receipts at plant.....	176,171	24,162	13,845	16,927	13,761	22,782	11,710	7,768	16,887	9,299	12,600	9,540	16,890
Book adjustments (account of inventory).....	+46,855	-2,563	-2,860	+5,577	+2,103	+1,271	+14,459	+2,047	+6,480	+4,419	+2,766	+103	+13,053
DISPOSITION, TOTAL.....	9,843,144	813,734	972,255	1,107,971	1,091,657	818,129	608,139	613,081	714,838	775,761	883,105	757,187	687,287
Shipments.....	4,860,254	425,354	476,871	545,178	493,600	393,271	307,774	303,755	374,319	370,733	416,880	401,579	350,940
Used in reporting plants...	4,982,890	388,380	495,384	562,793	598,057	424,858	300,365	309,326	340,519	405,028	466,225	355,608	336,347
Stocks on hand, end of month.....	...	1,119,358	1,033,209	886,831	752,657	841,462	1,021,884	1,164,084	1,237,266	1,216,803	1,188,075	1,185,307	1,276,267
CONCENTRATED SUPERPHOSPHATE (Basis 45% A.P.A.)													
SUPPLY, TOTAL.....	...	124,879	129,166	134,292	139,468	142,368	149,288	160,977	159,526	147,007	156,621	148,844	156,427
Stocks on hand, beginning of month.....	...	66,356	64,279	67,536	60,676	63,865	78,171	88,896	82,556	73,792	72,542	82,124	79,575
Production.....	862,345	58,511	64,887	66,759	78,733	78,503	71,040	71,638	76,448	72,333	81,753	66,526	75,214
Receipts at plant.....	4,164	...	...	...	...	...	...	443	635	444	716	268	1,658
Book adjustments (account of inventory).....	+1,986	+12	...	-3	+59	...	+77	...	-113	+438	+1,610	-74	-20
DISPOSITION, TOTAL.....	847,741	60,600	61,630	73,616	75,603	64,197	60,392	78,421	85,734	74,465	74,497	69,269	69,317
Shipments.....	833,583	59,914	61,059	72,732	74,821	63,559	59,858	77,330	83,891	72,365	72,926	68,190	66,938
Used in reporting plants...	14,158	686	571	884	782	638	534	1,091	1,843	2,100	1,571	1,079	2,379
Stocks on hand, end of month.....	...	64,279	67,536	60,676	63,865	78,171	88,896	82,556	73,792	72,542	82,124	79,575	87,110
WET-BASE GOODS (Basis 18% A.P.A.)													
SUPPLY, TOTAL.....	...	25,460	26,562	24,918	20,419	6,459	6,712	6,910	10,392	13,662	14,464	16,694	19,228
Stocks on hand, beginning of month.....	...	17,972	20,781	19,100	10,817	3,202	1,658	5,457	5,251	7,709	9,304	9,847	14,127
Production.....	68,919	7,527	5,810	5,906	9,832	3,399	4,557	4,196	4,469	6,211	5,064	6,847	5,101
Receipts at plant.....	...	...	...	...	...	...	...	...	...	...	...	...	...
Book adjustments (account of inventory).....	-2,264	-39	-29	-88	-230	-142	+497	-2,743	+672	-258	+96	...	...
DISPOSITION, TOTAL.....	67,993	4,679	7,462	14,101	17,217	4,801	1,255	1,659	2,683	4,358	4,617	2,567	2,594
Shipments.....	40,554	2,563	4,296	6,448	9,397	1,827	570	1,307	2,253	3,745	3,990	2,048	2,110
Used in reporting plants...	27,439	2,116	3,166	7,653	7,820	2,974	685	352	430	613	627	519	484
Stocks on hand, end of month.....	...	20,781	19,100	10,817	3,202	1,658	5,457	5,251	7,709	9,304	9,847	14,127	16,634

Table 3.--SUPERPHOSPHATE: PRODUCTION, DISPOSITION, AND STOCKS, CLASSIFIED BY TYPE, IN THE UNITED STATES, 1951 Revised.

(In short tons - 2,000 pounds)

Product and item	Total	January	February	March	April	May	June	July	August	September	October	November	December
NORMAL SUPERPHOSPHATE (Basis 18% A.P.A.)													
SUPPLY, TOTAL.....	...	1,909,506	1,875,393	1,912,253	1,673,122	1,575,616	1,527,027	1,620,476	1,781,826	1,787,012	1,878,612	1,821,649	1,767,075
Stocks on hand, beginning of month.....	...	1,056,234	1,029,321	952,771	763,358	678,902	761,143	944,306	1,078,774	1,109,852	1,083,385	1,011,881	1,004,807
Production.....	9,493,472	844,754	832,633	943,970	896,448	880,265	745,786	668,989	694,399	669,310	774,058	799,281	743,579
Receipts at plants.....	141,724	8,473	13,710	16,474	13,983	12,598	11,514	5,468	5,857	8,154	20,815	7,851	16,827
Book adjustments (account of inventory).....	+19,637	+45	-271	-962	-667	+3,851	+8,584	+1,713	+2,796	-304	+354	+2,636	+1,862
DISPOSITION, TOTAL.....	9,620,237	880,185	922,622	1,148,895	994,220	814,473	582,721	541,702	671,974	703,627	866,731	816,842	676,245
Shipments.....	4,910,273	436,509	450,409	581,881	525,149	421,243	317,917	271,298	340,878	376,302	437,899	404,311	346,477
Used in reporting plants...	4,709,964	443,676	472,213	567,014	469,071	393,230	264,804	270,404	331,096	327,325	428,832	412,531	329,768
Stocks on hand, end of month.....	...	1,029,321	952,771	763,358	678,902	761,143	944,306	1,078,774	1,109,852	1,083,385	1,011,881	1,004,807	1,090,830
CONCENTRATED SUPERPHOSPHATE (Basis 45% A.P.A.)													
SUPPLY, TOTAL.....	...	117,395	118,356	128,478	132,105	129,268	122,566	124,320	127,592	121,024	123,710	134,319	123,143
Stocks on hand, beginning of month.....	...	55,252	59,774	61,654	68,551	65,766	68,359	64,396	67,271	65,086	65,971	73,002	70,213
Production.....	716,488	62,143	58,066	66,824	63,554	63,260	54,210	59,924	60,608	55,938	57,739	61,292	52,930
Receipts at plant.....	...	...	...	...	...	...	...	...	...	...	...	...	...
Book adjustments (account of inventory).....	+493	...	+516	...	...	+242	-3	...	-287	...	...	+25	...
DISPOSITION, TOTAL.....	705,877	57,621	56,702	59,927	66,339	60,909	58,170	57,049	62,506	55,053	50,708	64,106	56,787
Shipments.....	696,274	57,069	55,575	58,493	65,217	59,974	58,004	56,631	61,712	53,326	50,294	63,641	56,338
Used in reporting plants...	9,603	552	1,127	1,434	1,122	935	166	418	794	1,727	414	465	449
Stocks on hand, end of month.....	...	59,774	61,654	68,551	65,766	68,359	64,396	67,271	65,086	65,971	73,002	70,213	66,356
WET-BASE GOODS (Basis 18% A.P.A.)													
SUPPLY, TOTAL.....	...	27,031	24,549	24,838	19,117	10,622	6,190	11,236	14,010	16,555	20,218	21,680	22,070
Stocks on hand, beginning of month.....	...	18,404	19,283	16,712	12,465	6,041	4,125	5,266	7,962	10,834	10,691	13,151	15,186
Production.....	75,885	7,874	5,276	8,126	6,652	4,641	2,124	5,970	6,048	5,721	9,527	7,619	6,307
Receipts at plants.....	...	...	...	...	...	...	...	...	...	...	...	...	...
Book adjustments (account of inventory).....	+2,111	+753	-10	...	...	-60	-59	...	...	...	...	+910	+577
DISPOSITION, TOTAL.....	78,428	7,748	7,837	12,373	13,076	6,497	924	3,274	3,176	5,864	7,067	6,494	4,098
Shipments.....	66,046	7,482	6,951	10,014	10,964	4,355	520	2,503	2,670	5,524	6,347	6,061	2,655
Used in reporting plants...	12,382	266	886	2,359	2,112	2,142	404	771	506	340	720	433	1,443
Stocks on hand, end of month.....	...	19,283	16,712	12,465	6,041	4,125	5,266	7,962	10,834	10,691	13,151	15,186	17,972

DC-3 sprays range land in Montana for control of grasshoppers.

Entomologists study eight pesticides in Montana, Arizona

Newer Insecticides Tested For Grasshopper Control

TESTS with newer insecticidal materials against grasshoppers have been made regularly during 1950, 1951 and 1952 in Montana and Arizona.

Last month a Bureau of Entomology and Plant Quarantine report told of effectiveness of eight pesticides in controlling grasshoppers under various conditions.

The report was prepared by O. L. Barnes, F. T. Cowan, E. J. Hinman, N. J. Nerney and Lee Seaton of the Division of Cereal and Forest Insect Investigations.

Summary of their report, while not to be construed as recommendations of the insecticides for general use, should be of interest to members of the pesticide industry. It follows:

Aldrin—at 0.5 ounce per acre was unsatisfactory. A dosage of one ounce gave satisfactory kills only in short, green to drying alfalfa. At the time of application, the grasshoppers were young. Two ounces generally was satisfactory. Both one- and two-ounce dosages gave better results in solutions than in emulsions. The kill with emulsions was generally lowest in very dry and hot weather. In aircraft applications the kill decreased when the plane was forced to fly above 15 to 20 feet. There was little difference between 0.5 and one gallon per acre of oil solutions containing two ounces of aldrin when applied by aircraft.

Dieldrin—in emulsion tested at dosages of one, two and three ounces per acre in 1950 showed little difference in the average kills. In 1951 ground application of 0.5, 0.75 and one ounce in emulsion and oil solution gave about the same average mortality—92 per cent. Kills from aircraft applications on range were 97 to 99 per cent. The 0.75- and one-ounce dosages in emulsion did not give satisfactory kills in dry alfalfa at high temperatures in Arizona.

Heptachlor—gave satisfactory kills at dosages of one, two, three, four, six and eight ounces per acre in green to drying alfalfa under cool temperatures. The two lowest dosages were unsatisfactory in drying to dry alfalfa under moderate to high temperatures, and the three highest dosages were unsatisfactory under dry, hot conditions of midsummer. The four-ounce dosage gave highly satisfactory kills in aircraft applications on range land.

Compound 1189—gave satisfactory kills at 0.75 and one pound per acre, particularly when applied during dry, hot weather. It also

showed promise of good residual action.

CS-708—at a dosage of 0.75 pound per acre gave satisfactory kills in green alfalfa, but decreased in effectiveness in drying and dry alfalfa under dry, hot conditions.

Lindane—at 0.5 pound per acre in emulsion was satisfactory in alfalfa in early spring tests in Arizona, but was unsatisfactory at 0.5 and 0.75 pound under hot, dry conditions in July. The one-pound dosage gave satisfactory kills in early fall tests on alfalfa in Arizona, as did the 0.4-pound dosage in range land in Montana.

Methoxychlor—at three pounds per acre in emulsion gave satisfactory kills in spring tests, but both three- and four-pound dosages were unsatisfactory under hot, dry conditions in Arizona. Moderate to severe burning to alfalfa was noted in the later tests.

EPN—at six ounces per acre was satisfactory in spring tests in Arizona, but a two-ounce dosage in the same tests was unsatisfactory.

Baits

Baits containing aldrin, dieldrin and heptachlor at one and two ounces per 100 pounds of bran gave higher kills than baits containing four and eight ounces of chlordane when spread in green alfalfa in May and June. Aldrin, dieldrin and chlordane baits continued to kill six to seven days. Grasshopper kills from all baits were higher in July and August. Baits containing one ounce of aldrin per 100 pounds of bran gave a kill of 70 to 75 per cent when spread at 10 pounds per acre. At five and 7.5 pounds the kills were somewhat less. There was little difference in the kills obtained between wet and dry bait.

In Montana pear pomace and orange meal were tested as carriers for the toxicant in comparison with bran in dry baits. Pear-pomace bait gave the highest average kill and was apparently more palatable to grasshoppers than either bran or orange meal.

* * *

Main objective of the research in 1950, according to the report, was to obtain information on aldrin and to establish minimum effective dosages of the insecticide.

Tests were planned to compare various dosages applied in solutions or emulsions on small plots with ground equipment and on large plots with aircraft. Effectiveness of the pesticide at different seasons and under different crop conditions was given particular attention. Other objectives were to make preliminary tests of dieldrin, heptachlor, compound 1189, CS-708 (dilan), lindane and methoxychlor.

In 1951 attention was focused on the problem of finding minimum effective dosages of dieldrin and heptachlor and to obtain more data on the minimum effective dosage of aldrin. Testing of compound 1189 and CS-708 was continued.

Last year the objective of the entomologists was to continue testing of minimum effective dosages of heptachlor and to establish an effective dosage of EPN.

A detailed report of their tests and findings with each of the chemicals summarized follows:

Aldrin

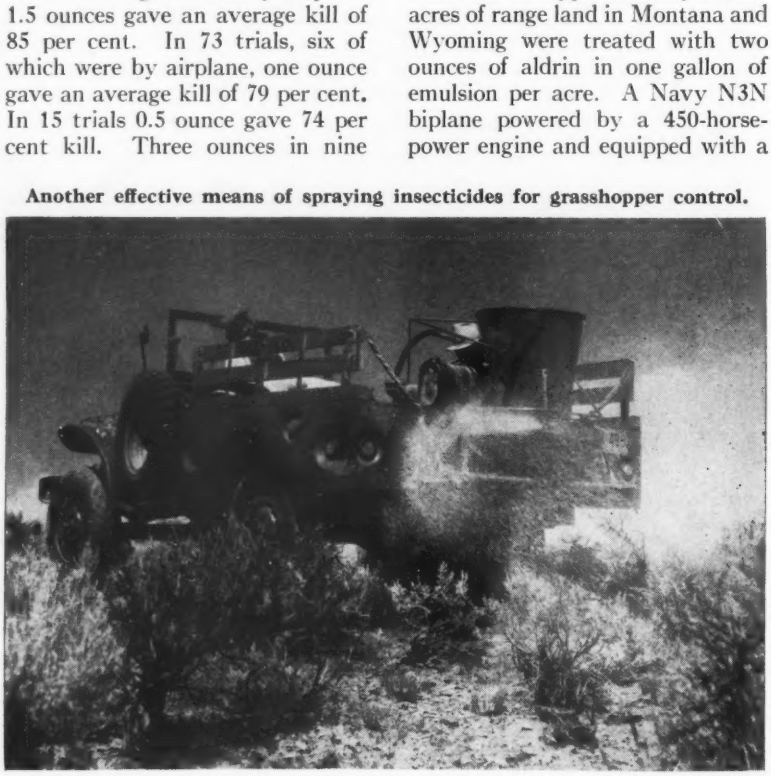
In 102 trials in which aldrin was applied at two ounces per acre, the average mortality after three–four days was 87 per cent. This included 18 applications by airplane on 40-acre plots and 84 by turbine blower on plots of 1¼, 2½ and five acres. In eight trials by airplane 1.5 ounces gave an average kill of 85 per cent. In 73 trials, six of which were by airplane, one ounce gave an average kill of 79 per cent. In 15 trials 0.5 ounce gave 74 per cent kill. Three ounces in nine trials gave a kill of 97 per cent.

These data show little difference between dosages of 1.5 and two ounces per acre. In the 1950 airplane tests in Montana, where both dosages were used, the difference was somewhat greater. The two-ounce dosage gave an average kill of 81 per cent and the 1.5-ounce dosage 85 per cent. After five–seven days the two-ounce dosage averaged 88 per cent and the 1.5-ounce dosage 83 per cent. At the end of the test the respective populations, measured by the pointer method, were 0.9 and 1.8 grasshoppers per square yard.

Dosages of one and two ounces per acre were compared in green to dry alfalfa in Arizona. In green alfalfa one ounce gave an average kill after three–four days of 88 per cent in 17 trials. Two ounces was slightly better at 91 per cent in the same number of trials. In 14 trials with each dosage in drying alfalfa the kills were slightly higher and in about the same proportion. One ounce killed an average of 89 per cent and two ounces, 93 per cent. In dry alfalfa both dosages were less effective. In 13 trials one ounce dropped to 64 per cent and two ounces to 72 per cent.

Large-scale spraying operations —In 1950 approximately 5,000 acres of range land in Montana and Wyoming were treated with two ounces of aldrin in one gallon of emulsion per acre. A Navy N3N biplane powered by a 450-horsepower engine and equipped with a

Another effective means of spraying insecticides for grasshopper control.



How You Can Get

Free Information

On each of the two postage-paid postcards below you can request further information on four items described on this and the Industrial News section of this issue. *Fill out one quarter section for each item in which you are interested.*

8-4 Dithane Booklet

"Dithane Fungicide for Crop Disease Control" is the title of a new folder from Rohm & Haas Co. It contains a spraying and dusting guide for field crops as well as a description of many of the diseases affecting crops. The company says Dithane alone will, in many cases, safeguard fields effectively and economically. **Code Number 8-4.**

8-5 Gortite Sleeves

If you are interested in making your machinery last longer and work harder, you'll want to see literature on Gortite sleeves, according to A & A Manufacturing Co., which makes them. An illustrated bulletin from the company shows them in use on many kinds of machinery. **Code Number 8-5.**

8-6 Fertilizer Equipment

Now available from Link-Belt Co. is a new book illustrating its services and equipment for the fertilizer industry. Typical arrangements for processing such materials as ammonium nitrate, superphosphate, triple superphosphate and granulated mixed fertilizer are shown in the 16-page book. **Code Number 8-6.**

8-7 Richardson Feeder

Phosphate rock, chemical materials and fertilizers all can be handled with a Richardson vibrating feeder. The company claims many advantages for its new feeder—it takes up little space, is inexpensive to operate, is exceptionally quiet and, if need be, will even feed uphill, according to company literature. **Code Number 8-7.**

8-8 Drum Handling Attachment

A semi-automatic horizontal drum handling attachment, which quickly and easily can adjust itself to a variety of drum sizes, now is being made by Clark

Use card at right to get information on products and bulletins. For additional requests write FARM CHEMICALS on company stationery, giving appropriate Code Numbers.

8-1 Anhydrous Tanks
8-2 Com-Bin Feeder
8-3 Maracarb N
8-4 Dithane Booklet
8-5 Gortite Sleeves
8-6 Fertilizer Equipment
8-7 Richardson Feeder
8-8 Drum Handling Attachment
8-9 Monsanto Solvents
8-10 Nonisols
8-11 Bagpaker
8-12 Spensol Solutions
8-13 Hayward Buckets
8-14 Roller Mills
8-15 Laboratory Equipment
8-16 Fertilizer Spreader
8-17 Fischbein Closer
8-18 Facts on Santomerse

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Equipment Co., company literature states. The attachment, which is completely interchangeable among Clark's entire line of fork trucks, can handle drums ranging in over-all length from 26 to 38 inches. **Code Number 8-8.**

8-9 Monsanto Solvents

Herbicide formulators should be interested in a new bulletin from Monsanto Chemical Co. on its two new solvents. The chemicals, phenylcyclohexane and bicyclohexyl, have favorable odor and toxicity characteristics. The former has both aromatic and aliphatic properties and good electrical resistance. Both are colorless oils. **Code Number 8-9.**

8-10 Nonisols

Literature and samples of Nonisols are available from Alrose Chemical Co. The Nonisols are nonionic surface active fatty acid esters of higher polyglycols and possess comparatively low melting points, high boiling points and low vapor pressure. Nonisol 210 is useful in pesticide formulations. **Code Number 8-10.**

8-11 Bagpaker

Better protection and faster packaging at lower cost—that's what the Model ET Bagpaker offers, according to its manufacturer, International Paper Co. The machine is quickly adjustable for bags of from 25 to 100 pound capacity, is completely portable and can handle 15 bags per minute with one operator when filled bags are continuously delivered to conveyor, according to company literature. **Code Number 8-11.**

8-12 Spensol Solutions

There are many good reasons for Spensol's popularity among mixers from coast-to-coast, according to Spencer Chemical Co., which makes the nitrogen solutions. They are described in technical literature from the company. An added feature at Spencer is the technical service provided free to members of the industry. **Code Number 8-12.**

8-13 Hayward Buckets

Severe superphosphate digging and handling can be done with a Hayward Class "K" Clam Shell, The Hayward Co. states. Information on this and other buckets of interest to farm chemicals manufacturers is available. **Code Number 8-13.**

8-14 Roller Mills

Phosphate rock, limestone and other non-metallic minerals can be finely or semi-finely ground with its roller mills, according to Bradley Pulverizer Co. Fineness of 20 to 325 mesh and capacities of one to 50 tons per hour can be obtained from the mills, company literature states. **Code Number 8-14.**

8-15 Laboratory Equipment

Latest design in specialized furniture and equipment for an agricultural laboratory is shown in a new six-page illustrated booklet from Laboratory Construction Co. Pictured in the booklet is the new Colorado Department of Agriculture Laboratory, which the company helped plan. **Code Number 8-15.**

8-16 Fertilizer Spreader

A new fertilizer spreader—one which operates easily, economically and accurately, guaranteed to spread any type of commercial fertilizer—is described in a booklet from Highway Equipment Co., Inc. It's called "The New Leader" combination commercial fertilizer and lime spreader. The literature is available to interested members of the industry. **Code Number 8-16.**

8-17 Fischbein Closer

The Fischbein Portable bag closer weighs only 10½ pounds and is a truly portable unit, literature from the company states. It is claimed to be the lowest priced bag closure on the market. It needs no installation and is ready to be plugged into any outlet. **Code Number 8-17.**

8-18 Facts on Santomerse

Increasing interest in wetting agents for fertilizers makes the recently issued Monsanto booklet describing its product Santomerse an important item for your consideration. The booklet answers the 19 most frequently asked questions on the use of the agents to speed reaction and improve texture of fertilizer mixtures. It points out that the addition of one pound of Santomerse No. 1 Spray Dried per ton of fertilizer permits proper reactions to take place in optimum time without addition of excess water. **Code Number 8-18.**

Reader Service inquiries will be honored up to six months after date of publication of the magazine in which they appear.

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boom-type sprayer was used in all tests. This plane could be calibrated to deliver 0.5 to one gallon of spray per acre in 50- or 75-foot strips.

Results were uniformly good, and populations were reduced to less than one grasshopper per square yard in all but one area. There apparently the combination of the tall cottonwood trees, forcing high flight of the plane, and the tall, lush growth of grass, hindering penetration of the spray to creek bottoms, contributed to the partial failure. Results were satisfactory on bench lands bordering the creek bottoms, in more typical range grasses.

In addition to the operations in Montana and Wyoming, 40,600 acres were sprayed in Graham County, Ariz., in a joint operation by the Bureau and the Arizona Commission of Agriculture and Horticulture.

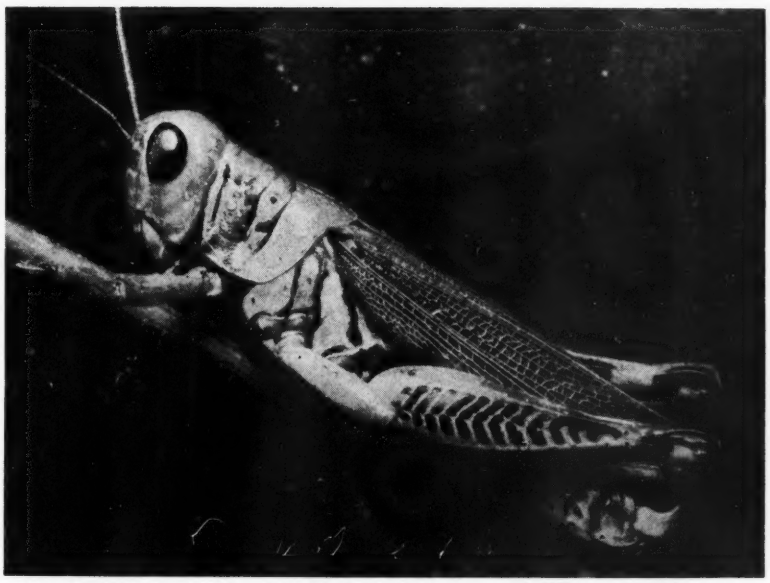
Sprays were applied by seven commercial and one Bureau-owned aircraft. Aldrin dissolved in kerosene was used at two ounces in 0.5 or one gallon of spray per acre. Flights were at low altitude, under 20 feet, except once or twice, when the pilots were forced to 50 feet or higher by rough terrain or trees. The sprays were applied in 50-foot strips.

Kills in three days ranged from 67 to 99 per cent, with an average of 91 per cent for 11 observation stations. Kills in five days were higher, with an overall average of 97 per cent. Population estimates five days after treatment showed 1.25 grasshoppers per square yard. One small area where high airplane flight was necessary showed only partial control and was resprayed. Results with 0.5 and one gallon of spray were almost identical.

Dieldrin

In 1950 dieldrin was tested at dosages of one, two and three ounces per acre in Arizona. In 18 trials at one ounce the average kill after three–four days was 95 per cent and in the same number of trials at two ounces, 97 per cent. Three ounces gave an average kill of 99 per cent in seven trials. Because all three dosages gave approximately the same kill the two higher ones were not tested further.

In 59 trials including applications in alfalfa and range grass by aircraft and turbine blower, one ounce per acre gave an average kill after three–four days of 93 per cent; at 0.75 ounce the average kill was 92 per cent in 43 trials and at 0.5 ounce it was 93 per cent in 20 trials. There was no difference between the average kills of the three dosages.



Here's the deadly foe of alfalfa and other crops. Entomologists conducted tests with many recently developed pesticides to seek control.

Dosages of 0.75 and one ounce per acre were compared in green to dry alfalfa in Arizona. In green alfalfa 0.75 ounce gave an average kill of 97 per cent in eight trials and one ounce 95 per cent in 15 trials. In drying alfalfa the average kill for 0.75 ounce in seven trials was 96 per cent and for one ounce, 97 per cent in 13 trials. In dry alfalfa at higher temperatures the 0.75-ounce dosage gave only 65 per cent kill in six trials. The kill from the one-ounce dosage was also much lower, averaging 83 per cent in 11 trials. A dosage of 0.5 ounce was not tested under dry, hot conditions in Arizona. Emulsions were used in all of the tests on alfalfa.

In range lands in Montana all three dosages—one, 0.75 and 0.5 ounce per acre—gave average kills of 95 per cent or better when applied in solutions by turbine blower or aircraft. The application by turbine blower gave slightly lower kills than those by aircraft.

Heptachlor

In 1950 tests were made with an emulsifiable concentrate containing 42 per cent of technical heptachlor. In 1951 and 1952 the material supplied by the manufacturer for testing was an emulsifiable concentrate containing 35 per cent of a product reported to be 70 per cent heptachlor and 30 per cent chlordane isomer. Two pounds of technical heptachlor per gallon was guaranteed. Because of this change in the basic formulation the results of the 1950 tests are not directly comparable with those made in 1951 and 1952.

In 1950 in 28 trials of heptachlor applied at one ounce per acre in emulsions in alfalfa and range grass the average kill after three–four days was 80 per cent; the two-ounce dosage in the same number of trials gave an average kill of 86 per cent and the three-ounce dosage in nine trials, 98 per cent. All dosages showed a tendency toward lower kills in dry alfalfa under higher temperatures later in the season. Applications on range land gave kills three per cent below the general average for alfalfa for dosages of one and two ounces.

In 1951 dosages of four, six, eight and 12 ounces per acre of heptachlor in emulsion were applied in alfalfa in Arizona by turbine blower. In 13 trials the four-ounce dosage gave average kills of 80 per cent, six ounces gave 88 per cent and eight ounces 89 per cent. In one trial a 12-ounce dosage gave

(Continued on page 70)

A 16 per cent increase . . .

Potash Production, Sales Up in 1952

DOMESTIC production of marketable potassium salts reached a new high in 1952, increasing more than 16 per cent above the 1951 production, according to reports by producers to the Bureau of Mines, United States Department of the Interior.

Sales and apparent consumption of potassium salts both increased in 1952, 12 per cent and four per cent respectively, compared with 1951. Stocks in producers' hands at the end of 1952, more than double the 1951 figure, were 171,807 short tons with a K_2O content of 99,061 tons.

Prepared by E. Robert Ruhlman and G. E. Tucker under the supervision of W. F. Dietrich, Chief, Ceramic and Fertilizer Materials Branch, Minerals Division, June 1953.

Both imports and exports of potash materials were down in 1952. Imports totaled 363,898 tons (190,862 tons K_2O) compared to 574,361 tons (313,617 tons K_2O) in 1951.

Import statistics in 1952 list East and West Germany separately. West Germany, East Germany, France, Spain and Chile, respectively, supplied 32, 27, 19, 11 and 8 per cent of the total United States imports of potash. Exports of potash materials totaled 101,200 tons, 19 per cent less than in 1951, with more than 97 per cent going to countries in the Western Hemisphere.

Production of higher-analysis materials continued to increase and was 86 per cent of the total potassium salts produced in the United States. Production of the lower grade muriate (49-50 per cent

TABLE 1—Salient statistics of the potash industry in the United States, 1950-1952

	1950	1951	1952
Production of potassium salts (marketable) ..... **short tons**	2,242,647	2,474,870	2,866,462
Approximate equivalent K_2O .... **short tons**	1,287,724	1,420,323	1,665,113
Sales of potassium salts by producers ..... **short tons**	2,221,920	2,451,913	2,757,252
Approximate equivalent K_2O .... **short tons**	1,276,164	1,408,408	1,598,354
Value at plant	$39,774,447	$44,788,880	$53,754,316
Average per ton	$17.90	$18.27	$19.50
Imports of potash materials ..... **short tons**	381,490	574,361	363,898
Approximate equivalent K_2O .... **short tons**	200,529	313,617[1]	190,862
Value	$13,993,974	$18,543,112	$13,102,739
Exports of potash materials ..... **short tons**	117,137	124,211[1]	101,200
Approximate equivalent K_2O[2] .... **short tons**	65,047	68,654[1]	56,281
Value	$5,534,176	$7,593,646[1]	$4,836,659
Apparent consumption of potassium salts[3] ..... **short tons**	2,486,273	2,902,063[1]	3,019,950
Approximate equivalent K_2O .... **short tons**	1,411,646	1,653,371[1]	1,732,935

[1]Revised figure.
[2]Estimate by Bureau of Mines.
[3]Quantity sold by producers, plus imports, minus exports.

K_2O) manure salts, sulfate of potash and sulfate of potash-magnesia all decreased in 1952. Production of manure salts dropped from a high of 260,339 tons in 1948 to 8,409 tons in 1952.

California, New Mexico and Utah continued to supply the major portion of the domestic production of potash. New Mexico supplied more than 88 per cent of the domestic potash marketed in the United States and a fifth major producer began operations in that state late in 1952. The potash producing companies in the United States in 1952, by states, were as follows:

California—American Potash & Chemical Corp. and A. M. Blumer.

Maryland—North American Cement Corp.

Michigan—Dow Chemical Co.

New Mexico—Duval Sulphur & Potash Co., International Minerals & Chemical Corp., Potash Co. of America, The Southwest Potash Corp. and United States Potash Co., Inc.

Utah—Bonneville, Ltd.

TABLE 5—World production of potassium salts and equivalent K_2O, by countries[1], 1947-52, in metric tons[2] (Compiled by Helen L. Hunt)

Country[1]	1947		1948		1949	
	Potassium salts	Equivalent K_2O	Potassium salts	Equivalent K_2O	Potassium salts	Equivalent K_2O
North America: United States	1,728,882	934,282	1,939,998	1,034,077	1,865,715	1,014,586
South America: Chile	3,259	900	6,655	1,913	5,020	1,422
Europe:						
France (Alsace)	4,168,725	632,844	4,470,260	683,585	5,285,649	798,510
Germany:						
West Germany	3,455,586	342,409	5,276,348	538,507	7,290,000	748,800
East Germany	[3]	720,000[4]	[3]	823,000[4]	[3]	[3]
Spain	917,865	195,892	992,743	151,185	918,156	151,542
Asia:						
India	4,211	2,032	3,020	2,540	6,456	3,048
Israel-Jordan[5]	123,163	60,830	9,724[6]	5,834[6]	.....	.....
Japan	2,259	135	1,984	120[4]	3,544	213
Africa: Eritrea	.....	.....	115	[3]	420	203
Australia:						
New South Wales	406	30	712	53	436	33
Western Australia	34,882	572	39,759	652	32,782	1,471
Total (estimate)	.....	3,000,000	.....	3,500,000	.....	3,900,000

Country[1]	1950		1951		1952	
	Potassium salts	Equivalent K_2O	Potassium salts	Equivalent K_2O	Potassium salts	Equivalent K_2O
North America: United States	2,034,485	1,168,197	2,245,153	1,288,489	2,600,397	1,510,557
South America: Chile	[3]	1,442	[3]	[3]	[3]	[3]
Europe:						
France (Alsace)	5,562,000	1,017,800	5,518,800	987,600	6,200,000[4]	1,054,000
Germany:						
West Germany	8,927,219	1,094,286	10,847,520	1,323,913	12,585,300	1,553,700
East Germany	[3]	[3]	[3]	[3]	[3]	[3]
Spain	1,013,333	161,619	1,058,884	172,870	1,052,016	172,644
Asia:						
India	5,589	2,743	6,486	3,251	[3]	[3]
Israel-Jordan[5]	.....	.....	.....	.....	.....	.....
Japan	3,396	203	3,897	[3]	2,614	157
Africa: Eritrea	555	264	.....	.....	.....	.....
Australia:						
New South Wales	406	30	456	34	425[4]	30[4]
Western Australia	919	84	.....	.....	.....	.....
Total (estimate)	.....	4,500,000	.....	4,900,000	.....	5,500,000

[1]In addition to countries listed, China, Ethiopia, Italy, Korea, and U. S. S. R., are reported to produce potash salts, but statistics of production are not available; estimates by senior author of chapter included in total.

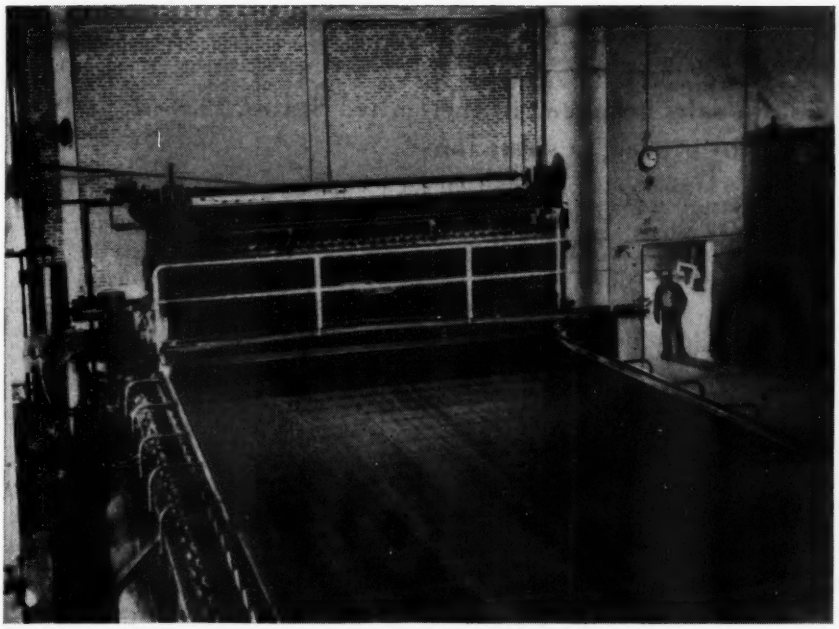
[2]This table incorporates a number of revisions of data published in previous potassium salts chapters.

[3]Data not available; estimate by author of the chapter included in total.

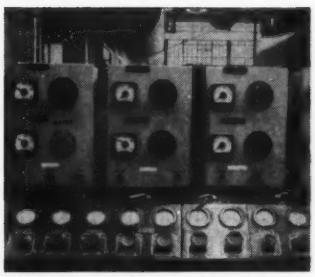
[4]Estimate.

[5]Year ended June 30 of year stated; 1947-48 is for Palestine. Extracted from waters of Dead Sea.

[6]Production ceased April 1948, due to damage to the plant of Palestine Potash Ltd.



Block-long Fourdriniers sitting side by side turn out an endless strip of kraft 24 hours per day, 7 days per week, 365 days per year. At "wet end" above, kraft is 96% water, 4% pulp. Scene is at modern Florida mill where Hudson Multiwall Sacks are made.



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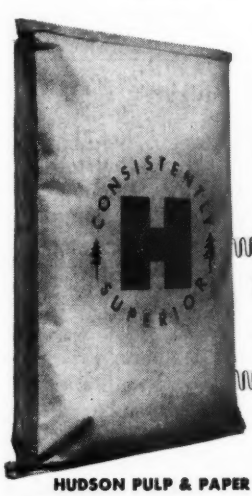

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TABLE 2.—Potassium salts produced in the United States, 1950-52, by grades, in short tons

Grade	1950	1951	1952
Muriate of potash:			
60–62 per cent K_2O minimum[1]	1,846,459	2,047,793	2,468,436
48–50 per cent K_2O minimum	151,547	155,797	150,959
Manure salts	21,532	19,775	8,409
Sulfate of potash and sulfate of potash-magnesia	223,109	251,505	238,658
Total	2,242,647	2,474,870	2,866,462

[1]Includes refined potash and some 93–96 per cent KCl.

TABLE 3.—Production and sales of Potassium salts in New Mexico, 1948-52, in short tons

	Crude salts[1]		Marketable potash salts				
	Mine Production		Production		Sales		
Year	Gross weight	K_2O equivalent	Gross weight	K_2O equivalent	Gross weight	K_2O equivalent	Value
1948	5,108,372	1,069,675	1,841,054	964,940	1,850,976	967,945	$29,177,328
1949	4,852,903	1,018,886	1,733,739	927,621	1,744,427	932,497	27,950,111
1950	5,802,004	1,198,021	1,904,565	1,086,996	1,878,094	1,072,772	31,944,365
1951	6,615,891	1,349,572	2,138,439	1,223,139	2,126,391	1,217,617	37,209,740
1952	7,852,732	1,644,034	2,530,596	1,468,029	2,439,042	1,411,125	46,385,452

TABLE 4.—Potash materials imported for consumption in the United States, by major world producers, 1948-52, in short tons (U. S. Department of Commerce)

Country	1948	1949	1950	1951	1952
Chile	64	6,970	20,434	12,305	27,965
France	17,883	29,602	63,534	59,193	70,728
East Germany	14,230	660	188,410	372,409	96,871
West Germany					116,046
Spain	95	87	49,272	94,878	40,656
Other countries[1]	20,618[2]	6,400	59,840[3]	35,576[4]	11,632[5]
Total	52,890	43,719	381,490	574,361	363,898

[1]For detailed breakdown by countries see Minerals Yearbook.
[2]Includes 14,275 short tons from U. S. S. R.
[3]Includes 32,554 tons from Poland-Danzig and 17,974 tons from U. S. S. R.
[4]Includes 11,755 tons from Poland-Danzig and 13,906 tons from Belgium-Luxembourg.
[5]Includes 5,477 tons from Netherlands and 2,174 tons from Belgium-Luxembourg.

FERTILIZER MATERIALS MARKET

New York

July 10, 1953

Sulfate of Ammonia

The domestic price schedule remains unchanged compared with last year, with the exception of two points advancing price $2 per ton and one point lowering price $1 per ton. Demand is slow at present.

Ammonium Nitrate

A good demand still exists for this material and shipments are going forward against current orders.

Urea

Some domestic producers advanced the price of this material $10 per ton, effective July 1, with the result that the imported material is quoted at about $135 per ton at the ports.

Nitrogenous Tankage

Prices of this material range from $3.75 to $4.25 per unit of ammonia ($4.56 to $5.16 per unit N), according to shipping point. A certain amount of interest has been shown by buyers for nearby shipment but not much interest is noted for future.

Castor Pomace

With the active fertilizer season over, price of this material has been reduced to from $31 to $32 per ton, f.o.b. production points, with better buying interest noted.

Organics

Organic fertilizer materials showed a rather weak tendency price-wise but a good amount of buying was noted at present reduced prices, with some buyers of the opinion decline has gone far enough and they want to get in at the present market level. Tankage and blood were quoted at $4.50 to $5 per unit of ammonia ($5.47 to $6.08 per unit N), f.o.b. eastern points and soybean meal remained at approximately $66 per ton, in bulk, f.o.b. Decatur, Ill. Linseed meal was slightly easier in price and cottonseed meal still was being sold by government agencies. Feed buyers were showing more interest because of drought conditions in the southwest.

Fish Meal

With fishing reported better than two weeks ago, more of this material was available for quick shipment with last sales at $125 per ton for the scrap and $5 per ton more for the meal.

Bone Meal

Some scattered sales have been made of this material. With prices about $20 per ton cheaper than a year ago, a few buyers are taking on a limited amount of material for next season's use.

Hoof Meal

This material sold slightly lower at $6 per unit of ammonia ($7.29 per unit N), f.o.b. Chicago, for prompt shipment. Demand is fair.

Superphosphate

Domestic 20 per cent superphosphate was raised by the producers 2 cents to 5 cents per unit according to shipping points, effective July 1, because of the increase in costs, mainly due to increased price of sulfur. Material is plentiful for nearby shipment. Triple superphosphate advanced from 91 cents per unit to 98 cents per unit, f.o.b. Tampa, Fla., in bulk.

Potash

Producers report a large amount of contracts placed for the coming season at unchanged prices compared with last year. Some imported material continues to be offered, mostly at southern ports.

Low Grade Organics

Demand was limited for garbage tankage, sludge and similar materials, but cocoa shells were moving well because of limited production at this time of year.

Philadelphia

July 10, 1953

Market is very quiet. Substantial increases took place July 1 in the prices of nitrate of ammonia, nitrogen solutions and urea. Normal and triple superphosphate also were slightly advanced. However, cyanamid, castor pomace and nitrogenous tankage prices are reduced. The market for packinghouse by-products presently is quite weak, in the absence of demand. The supply position of nitrate of ammonia remains exceedingly tight, while sulfate of ammonia, nitrate of soda and potash are in ample supply. While recent sales of mixed goods have been behind 1952, the total present season up to June 1 is considerably ahead of the same eleven months in last year.

Sulfate of Ammonia.—Market is seasonally quiet with normal withdrawals against contracts and supplies are sufficient to meet requirements. No price changes have been announced.

Nitrate of Ammonia. Demand continues ahead of production. New prices for domestic grade are quoted $68 to $70 per ton, depending upon the producer; and Canada $77.50 per ton at producing plant.

Nitrate of Soda. Demand is reasonably satisfactory for this time of the year. Supply is adequate and no price changes are reported.

Blood, Tankage, Bone.—In the absence of demand for blood and tankage the market remains nominal at $4.75 to $5 per unit ammonia ($5.77 to $6.08 per unit N), with steamed bone at $60.

Castor Pomace.—There is pronounced absence of interest in this material and price has been lowered to $32 per ton.

Fish Scrap.—The catch is reported fairly good but demand is very slow and price reductions are anticipated.

Phosphate Rock.—Market is reported stronger and movement satisfactory, but supply position is inclined to be somewhat tight.

Superphosphate.—Price advance

FERTILIZER MATERIALS MARKET

was less than expected and the normal grade is now quoted at 88 cents to 91 cents per unit APA per ton, with triple at 98 cents per unit, f.o.b. production points.

Potash.—Domestic production has increased considerably and buyers are reportedly slow in renewing their requirements contracts. Supply position is said to be quite comfortable.

Charleston

July 10, 1953

Potash prices for the new season from domestic sources are practically the same as last season but imported potash is slightly less than previous imported quotations by the same importers. Several forms of nitrogen have advanced in price over last season's price. Both triple superphosphate and normal superphosphate, generally, are higher for the new season than last season.

Organics.—Activity in the organics market has increased in the last few days as a result of the announcement of the new price of Chicago Sewage Sludge reported at $2.75 per unit of ammonia ($3.34 per unit N) and 50 cents per unit of APA. At the same time, domestic nitrogenous tankage is offered for summer, fall and spring shipment at prices ranging from $3.15 to $4.65 per unit of ammonia ($3.83 to $5.65 per unit N), bulk, f.o.b. production points. Imported nitrogenous is indicated at approximately $5 to $5.35 per unit of ammonia ($6.08 to $6.50 per unit N), in bags, c.i.f. Atlantic ports.

Castor Pomace.—Rather little activity is noted in this market and prices are approximately $30 per ton in burlap or paper bags, seller's option, f.o.b. northeastern production points.

Blood.—Unground bulk dried blood is indicated at Chicago at $4.75 to $5 per unit of ammonia ($5.77 to $6.08 per unit N), and the New York market is around $5 to $5.25 ($6.08 to $6.38 per unit N).

Potash.—Prices as previously indicated by domestic producers are unchanged and the majority of domestic users have contracted for their expected needs. No noticeable change is indicated in the price or supply of imported material.

Ground Cotton Bur Ash.—This source of carbonate of potash, particularly adaptable for use in tobacco fertilizers, is available for prompt and future shipment at prices approximating the delivered cost of domestic sulfate of potash. Analysis currently is 38 per cent to 42 per cent K_2O.

Phosphate Rock.—Market position continues firm and shipments steady. High-grade is shorter in supply than low-grade rock.

Superphosphate.—Demand for triple superphosphate, even at the advanced price of 98 cents per unit APA at Tampa, is very heavy but at this time of the year call for normal superphosphate is relatively slack.

Sulfate of Ammonia.—Effective July 1, the price on sulfate of ammonia at Eldorado, Ark., advanced $2.50 to $49.50 and it is reported that this article at Chicago is up $2 to $47 bulk. A domestic producer is asking $50 per ton, bulk, at South Atlantic ports. Importers are generally asking $47 per ton f.o.b. cars South Atlantic ports and in the Gulf, for fall arrival.

Nitrate of Soda.—Imported stocks are adequate and demand slack at this time of the year. No change in prices has been announced.

Calcium Ammonium Nitrate.—Limited stocks continue available at major Atlantic and Gulf ports at $51.25 per ton, in bags, f.o.b. cars at dock at the ports.

Ammonium Nitrate.—This market continues tight and effective July 1 two more domestic producers have advanced their prices $4 f.o.b. Eldorado, Ark., and $5.20 f.o.b. Etter, Tex., respectively, making the new prices $68 Eldorado and $70 Etter.

Industrial News

New Products **New Plants** **New Appointments**

President Establishes Ag Advisory Commission

Better coordination of the government with the nation's agriculture should come about with establishment of a new commission by President Eisenhower.

The president late last month issued an executive order establishing an 18-man bi-partisan National Agricultural Advisory Commission.

Its purpose is to review national farm policies and the administration of farm programs and to make recommendations to the Secretary of Agriculture for the betterment of such policies and programs.

The new commission is established on a permanent basis, replacing a 14-man interim advisory agricultural committee appointed last December.

Cyanamid Names Three Men To New Positions

American Cyanamid Co. recently appointed J. J. Fitzgerald, R. T. Lukat and H. E. Graulich to new positions with the company.

Fitzgerald is assistant to the plant manager of the company's new nitrogen plant under construction near New Orleans. He joined American Cyanamid in 1949.

Lukat, formerly with Commercial Solvents Corp., has been named ammonia department superintendent and Graulich, production supervisor. Prior to his appointment, Graulich worked with Chemical Construction Corp. and Lederle Laboratories Div.

Gillespie Heads Sales Department for Swingfire

John T. Gillespie Jr. is new sales manager of Swingfire Division of Devenco Incorporated. He will direct merchandising of the division's "Swingfog" insecticide applicator and other Swingfire products. Gillespie's headquarters will be in New York City.

George F. Leonard Retires As Tobacco By-Products VP

GEORGE F. ("Grub") Leonard, executive vice-president of Tobacco By-Products and Chemical Corp., Richmond, Va., retired July 1 after 38 years with the corporation.

He has been active in the pesticide industry for many years and was one of the founders of the Agricultural Insecticide & Fungicide Association, which later became the National Agricultural Chemicals Association. He was president of NAC for three years, and has served on numerous committees, presently heading the NAC finance committee.

Leonard was chairman of the Industry Committee of the OPA in Washington during World War II and later was a member of the industry over-all committee. He has been actively interested in developing a better working relationship between the government and the pesticide industry.

A native of Michigan, Leonard is a graduate of Michigan State College. After teaching school for two years, he joined the sales staff of Tobacco-By-Products in Louisville. He was named sales manager and later moved to Richmond as executive vice-president, the position he held at retirement.

George F. Leonard

Leonard was president of the Louisville Building and Loan Association for ten years. He is a veteran of World War I and a member of the Entomological Society of America.

"Grub's" future plans are indefinite, but he plans to spend much of his time working with his orange trees in Florida and doing a little fishing. He expects to attend the NAC meeting at Spring Lake in September and also to keep in contact with the insecticide industry.

Mueller Gets Position As Grace Technologist

New chief technologist of Grace Chemical Co.'s $19 million nitrogen plant, now under construction near Memphis, is Max F. Mueller.

Mueller formerly was chief engineer for J. T. Baker Co. and has been engaged in project and process engineering work for the chemical industry in Michigan, Maryland and Pennsylvania.

Temporarily, he will be assigned to Grace's New York development department until he takes up his duties as chief technologist.

Universal Detergents Adds Sales Agencies

Four new sales agencies have been appointed by Universal Detergents, Inc. of Long Beach, Cal.

Goldpar Distributors, New York; Martin Terr, Boston; George E. Moser & Son, Inc., Detroit and Edward J. Lewis Co., Chicago will represent the company, according to B. R. Bryant, general manager.

Industrial News

New Nitrogen Solution Made By Nitrogen Div.

Sodan, a new direct application nitrogen solution—the first to contain nitrate of soda—was introduced last month by Nitrogen Division, Allied Chemical & Dye Corp.

Special feature of the new solution, according to the corporation, is its nitrate of soda content which characteristically gives crops a vigorous growth, deep green foliage and the ability to resist bad weather and produce increased yields.

The new solution is a clear, colorless liquid containing approximately 20 per cent nitrogen.

Shell Reports Dieldrin Granulated Successful

Dieldrin granular formulations have been found to give new, improved control of a wide range of insects in home lawns, turf and nursery and greenhouse soils, according to Shell Chemical Corp..

The formulations recently received label acceptance from the USDA for use against lawn chinch bugs, white grubs, ants, Japanese beetle grubs and other turf pests.

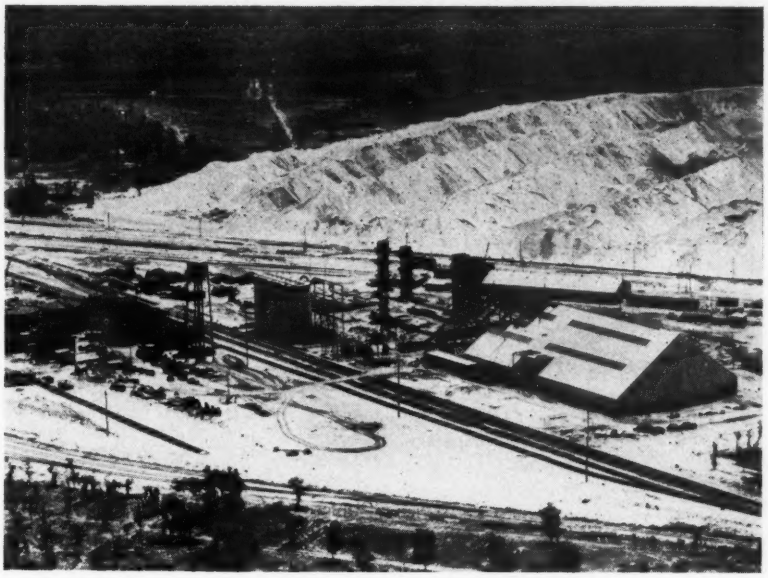
A five per cent granular dieldrin formulation is applied at the rate of one pound per 725 square feet for turf insect control, except in Florida where rates are slightly higher. They easily can be applied alone or in combination with fertilizers, Shell states.

Cushing Sales Head For Meyer Phosphatics

Thomas R. Cushing will manage phosphatic fertilizer sales for Wilson & Geo. Meyer & Co.'s fertilizer department, according to an announcement by L. N. West, executive vice-president of the company.

Cushing will be associated with Ralph S. Waltz, department manager, in the sales and distribution of the firm's agricultural chemicals throughout the eleven western states.

New Davison Triple Super Plant



Davison Chemical Corp.'s $12 million plant for triple superphosphate manufacture at Bartow, Fla. (above) is scheduled for completion late this year.

At right, the building most nearly completed is a finished product warehouse, 325 feet long. Large concrete silos near center are for storage of phosphate rock.

Erection of the main process building, expected to have an annual capacity of 200,000 tons, recently was started adjoining the silos.

OEEC Discusses Pasture Fertilization at Meeting

Pasture fertilization and grassland renovation were subjects studied at a course held May 18-23 by the Organization for European Economic Cooperation's working party on grassland improvement in Belgium.

Following is a summary of some conclusions, recently released by the organization:

More basic information is needed on the most efficient and economical means of improving grassland and forage production.

Grassland development, for years, has been concerned only with increasing starch and protein yield, though in some countries the importance of mineral balances now is recognized and research is being carried out.

Research workers differ on the influence of mineral content of herbage to animal health. A seminar prepared by O. E. E. C. was suggested to enable workers to exchange views on the subject.

A further difference of opinion exists among research workers on methods to be used for soil testing and plant analysis.

Of high importance to an improvement plan is an adequate supply of valuable strains of grasses and legumes. An international exchange of stock-seed or elite-seed of grasses was suggested.

Sloan Goes To St. Regis Paper Canadian Branch

Hugh W. Sloan, former vice president of St. Regis Sales Corp., now is associated with St. Regis Paper Co. (Canada) Ltd.

Sloan will assist Thomas H. Cosford, vice president and director of the parent company and vice president and managing director of the Canadian company.

Industrial News

Program for Anniversary Meeting Announced by NAC

FINAL plans for the National Agricultural Chemicals Association's big anniversary convention in September were announced by the organization late last month, with leading industry speakers and a panel on fertilizer-pesticide mixtures highlighting the program.

The convention, celebrating the 20th anniversary of the pesticide trade organization, will be held at the Essex and Sussex Hotel, Spring Lake, N. J., Sept. 9, 10 and 11.

Throughout the meeting special observance of the anniversary will be made, according to Lea Hitchner, executive secretary of NAC.

Additional facilities for the convention will be available at the Monmouth Hotel.

Members of the association will have their first opportunity to hear an address by an official of the new administration when J. Earl Coke, assistant secretary of agriculture, speaks before the session.

Principles of merchandising chemicals to the American farmer will be set forth by W. R. Allstetter, vice president of the National Fertilizer Association, in another talk.

Two other talks which should have special interest to delegates attending the convention will be given by Richard O. White and Dr. George L. McNew.

White, chief of the registration section of the Insecticide Division, USDA, will air the major problems involved in registering pesticides.

Dr. McNew, director of Boyce Thompson Institute, Yonkers, N. Y., will discuss the importance and place of fungicides in agricultural production.

George P. Larrick, deputy commissioner of the Food and Drug Administration, will discuss the problems and relationships of the FDA to the pesticide industry and the public.

In keeping with the anniversary theme of the convention, Brigadier General Joseph F. Battley, president of the National Paint, Varnish and Lacquer Association will cite some of the services a trade association can bring to its members and to the public.

Speaking on the fertilizer-pesticide mixture panel will be the following leaders in the field:

Dr. M. D. Farrar, Head, Department of Entomology, Clemson Agricultural College, Clemson, S. C., Dr. Rodney C. Berry, state chemist, Virginia Department of Agriculture; Dr. C. C. Compton, Julius Hyman Div., Shell Chemical Corp. and Eugene Ordas, head of the product development division, Velsicol Corp.

Dr. L. Gordon Utter, Diamond Alkali Organic Chemicals Division, Inc., will preside at the panel, with one more panel member to be selected.

Other business scheduled for the three-day meeting includes election of officers and three members of the 15-member board of directors. Board members who have completed their terms are W. C. Bennett, president of Phelps Dodge Refining Corp.; J. Hallam Boyd, executive vice president of Commercial Chemical Co. and Ernest Hart, executive vice president of the Food Machinery and Chemical Corp.

Arthur W. Mohr, association president and president of California Spray-Chemical Corp., will address the convention on the opening day.

Lea S. Hitchner, executive secretary of NAC, will follow with a report of the year's activities. NAC Vice President Paul Mayfield, general manager of the Naval Stores Department, Hercules Powder Co., will preside.

A reception for members and guests will be held the first evening. Special entertainment and dancing are scheduled for each evening throughout the meeting, with the annual golf tournament set for Thursday afternoon.

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Industrial News

Chemical Industry Show Planned on Bigger Scale

The 24th Exposition of Chemical Industries, to be held in Philadelphia's Commercial Museum and Convention Hall, Nov. 30 to Dec. 5, has been planned on a much broader pattern than the 1951 New York exposition.

Exceptionally heavy attendance is expected by the exhibitors because of the rapid penetration of chemistry into new industrial applications and desire of manufacturers to receive more information about significant developments of the past two years.

Davison Sets Up Three Regional Sales Offices

Three new sales offices have been established by the Industrial Chemicals Division of Davison Chemical Corp. to enable the corporation to better serve and more frequently contact its customers, according to D. N. Hauseman, vice president.

Resident field service engineers, C. E. Meginnis, C. Victor Bolles and E. Kyle Ruble, will direct the offices, located respectively at Chicago, Lake Charles, La. and Columbus, O.

Make Anhydrous Tanks

Anhydrous ammonia tanks, of 500 and 1000 gallon capacity, are being manufactured by the Boardman Co. of Oklahoma City, Okla.

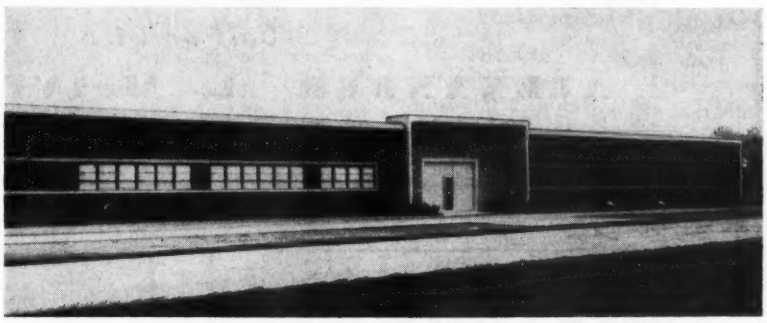
The tanks have hemispherical heads, are designed for 250 p. s. i. working pressure, bear the National Board of Boiler and Pressure Vessel Inspectors stamp of approval and meet all state requirements for this type of vessel, the company reports.

Baffles and supporting feet are featured for easy truck or trailer mounting.

The tanks are finished with aluminum paint and have threaded openings for all the proper fittings.

For further information, fill out a **Readers' Service** card, using **Code Number 8-1.**

Bemis Opens Plant in Memphis



Bemis Bro. Bag Co.'s modern new 120-thousand square foot plant located in Memphis is shown above.

Efficient operation and employe comfort are stressed in the one-story, steel, concrete and brick building, according to Bemis.

The company says it has been moving piecemeal from its former Memphis location to insure uninterrupted service to its customers. Address of the new plant is 1975 S. Latham.

Improved Method Sought For Establishing Grasses

Establishing grassland crops for pasture, silage and hay, a problem which long has troubled farmers, may be answered by drilling grass and clover seed at a depth of one-fourth inch and placing fertilizer in bands one inch below the seed, with the soil packed over the seed, reports the USDA.

Tests are under way at the Agricultural Research Center in Beltsville, Md. to develop better methods of planting these crops, and the first season's results were favorable to such precision placement of both seed and fertilizer.

Should further tests confirm the first season's work, they would discourage use of broadcast plantings and fertilization now commonly used by farmers.

D. J. Bird Elected Head Of Superphosphate Assn.

D. J. Bird, of the United Kingdom, recently was elected president for 1953–54 of the International Superphosphate Manufacturers' Association at its annual series of meetings recently held in Stockholm, Sweden.

He succeeds R. Standaert of Belgium, who served as president of the association since 1949. Standaert, who did not offer himself for reelection because of health, was unanimously elected honorary president.

Five vice-presidents, H. Buhrer, Switzerland; J. Capelo Portabella, Spain; B. Colbjornsen, Sweden; R. Grandgeorge, France and J. D. Waller, Holland were elected or re-elected. Dr. G. F. New was appointed secretary.

Industrial News

One Fertilizer Bill Passed, Another Pending

Two pieces of legislation of interest to the fertilizer industry recently gained partial or final approval in Illinois and Pennsylvania.

The Illinois bill (H.B. 674) sets a penalty of not less than $100 nor more than $300 for failure to comply with provisions of fertilizer law. This bill recently was signed by the governor.

Pennsylvania's (H.B. 1603) would provide for marking of anhydrous ammonia containers, and prohibit the filling, refilling or delivery of containers by persons other than the manufacturer or distributor of anhydrous ammonia. State Department of Labor and Industry approval would be required for erection, maintenance or operation of a bulk storage plant. The department also shall prescribe safety regulations for handling, storage and transportation of anhydrous ammonia. The term "anhydrous ammonia" includes ammonia and any ammonia solution having a vapor pressure of 15 psi gauge and over at 70° F. This bill has passed the House.

Salvesen at Conference

J. Richter Salvesen, director of Marathon Corp.'s central research dept., is attending the 13th International Congress of Pure and Applied Chemistry in Stockholm, Sweden, July 29 to Aug. 4.

Salvesen has been named honorary chairman of the lignin section of the Wood Symposium in recognition of his 27 years of research on lignin products for the company's chemical division.

Chase Promotes Rue

Chase Bag Co. recently promoted Harrison B. Rue to branch manager at Buffalo.

Rue, who served as a captain in the Marines during World War II, joined Chase as a salesman immediately after the war. Prior to his promotion he was acting manager of the Buffalo branch.

Promoted

C. W. Mitchell

C. W. Mitchell recently was named executive vice-president of Nyotex Chemical Co., of Houston, Tex., according to an announcement by G. L. Bond, president of Consolidated Chemical Industries Inc.

Mitchell spent 17 years with the Missouri Pacific Railroad and has been with Consolidated Chemical for 24 years. Prior to his promotion he was vice-president of Nyotex.

Nyotex Chemical Co., manufacturer of lime, hydrofluoric acid and aluminum chloride, is a mutually owned subsidiary of Consolidated Chemical Industries Inc., Stauffer Chemical Co. and Harshaw Chemical Co.

Chemicals for Cabbage

Bursting of cabbage heads was reduced almost 50 per cent by controlling insects which fed upon them, in tests conducted by the New York Experiment Station.

The tests further showed that yields were substantially increased with fertilizers, but increasing the amount of fertilizer led to an increasing amount of bursting unless insect injury was held in check at the same time. Insecticides proved beneficial, regardless of the amount of fertilizer used.

Fertilizer Committee To Discuss Utilization

A fertilizer industry advisory committee has been asked by the National Committee for the More Efficient Use of Fertilizer and Lime and the National Grasslands Steering Committee to discuss with them plans for projecting the fertilizer utilization program.

The two committees will hold meetings Sept. 10. The industry committee is scheduled to meet with each of them Sept. 11. The following have been invited to participate:

W. T. Wright, F. S. Royster Guano Co.; W. F. Price, Plant Food Div., Swift & Co.; W. T. Watmough, Davison Chemical Corp.; Richard E. Bennett, Farm Fertilizers, Inc.; Arthur R. Mullin, Indiana Farm Coop. Assn., Inc.; B. H. Jones, Sunland Industries, Inc.; J. H. Epting, Epting Distributing Co.; George E. Petitt, Potash Co. of America; John R. Riley Jr., Spencer Chemical Co.; Fred T. Techter, The Nitrogen Div., Allied Chemical & Dye Corp.; Owen Cooper, Mississippi Chemical Corp.; Paul T. Truitt, American Plant Food Council and Dr. Russell Coleman, The National Fertilizer Association.

Vasbinder Heads Branch

V. G. Vasbinder now is branch plant manager of The Davison Chemical Corp.'s mixed fertilizer plant at Lansing, Michigan.

Before his promotion, Vasbinder was assistant branch manager of the Lansing plant. He fills the post formerly occupied by B. C. Manker who, in July, 1952, was made district manager at Lansing, with a number of Davison fertilizer plants under his supervision.

Campbell Appointed

Dr. Joseph D. Campbell has been named horticulturist in the agricultural department of Mathieson Agricultural Chemicals Div., Mathieson Chemical Corp.

He will make his headquarters in the company's Baltimore office and

will be associated with Dr. A. M. Smith, chief agriculturist.

Formerly, Campbell held the rank of captain in the Royal Canadian Air Force during and after World War II, and during the past year has been teaching horticulture at the University of Massachusetts.

Building Anhydrous Unit

Mill Creek Chemical Co., Dallas, Tex., plans to construct a $9 million anhydrous ammonia plant in Salt Lake City, Utah, according to an announcement by J. B. Allison, official of the Henry C. Beck Co.

Glore, Forgan and Co., investment bankers, will back the project. A. C. West, president of the chemical company, is a partner in Glore, Forgan.

Decision Still Pending On RX-15 Fertilizer Suit

A decision still is pending in the case initiated by the government through the Federal Trade Commission against Garden Research Laboratories of Madison, N. J., a corporation, and Huber Hoge & Sons, Inc., an advertising agency, for alleged false claims relative to "RX-15," a liquid fertilizer.

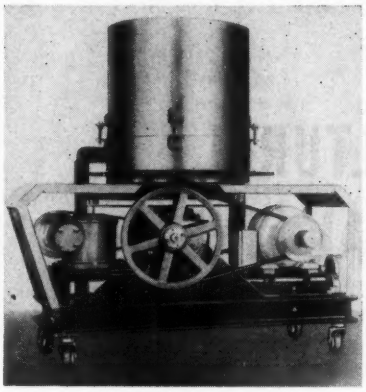
Hearing Examiner John Lewis, following testimony at a proceeding in New York City, is reviewing the record to determine what order, if any, should be issued against the respondents.

Some of the advertising statements challenged by the commission are the following:

"Plant scientists . . . discovered that when this super-powerful plant food of a type called RX-15 is dissolved in water and sprinkled on leaves of plants, the leaves absorb it instantly!

"RX-15 gives you a scientifically balanced 15–30–15 formula that's three times more powerful, yet completely safe to use . . . RX-15 also provides a balanced diet of oft-neglected manganese, copper, boron, zinc, vitamins and hormones plus essential trace elements and minerals."

8-2 Com-Bin Feeder



Com-Bin rental unit

Several companies in the farm chemicals field are using Com-Bin Feeders, Pulva Corp. states.

The units, which were placed on the market about a year ago, now may be rented by firms desiring to run Com-Bin pilot tests in their own plants.

Main advantage of the feeders, the company says, is their ability to handle satisfactorily a wide range of difficult-to-feed materials, such as filter and centrifuge cake, or any products containing moisture or oil which makes them sticky and non-flowable.

For complete information on the new feeders, fill out a **Reader Service** card, using **Code Number 8-2.**

State Amends Rules

An amendment has been made to the Rules, Regulations, Definitions and Standards of the North Carolina Department of Agriculture regarding insecticides in fertilizers.

Technical chlordane, aldrin, dieldrin, heptachlor or toxaphene in fertilizers may be sold in North Carolina under the following conditions:

1. That brands or mixtures containing these materials shall be registered with the Department of Agriculture.

2. Each bag must bear a red tag, 3⅛ inches by 6¼ inches, containing the following information:

CAUTION

This fertilizer contains..... pounds of (name of insecticide) per 100 pounds of fertilizer.

Notice—IMPORTANT—Notice Experiments and surveys have shown that this insecticide when applied with fertilizer at planting time may give some control of wireworms and/or southern corn rootworms and/or white fringed beetle. It does not effectively control the corn bill-bug. In experimental work insecticide-fertilizer mixtures have been applied immediately after mixing. The effect of the combination on the insecticide or on the fertilizer components, if left to stand, is not known. Odor, off flavor, stunting of crops and other damage may result from the use of organic insecticides in this manner.

The following change in the method of reporting tonnage was made in another amendment:

Effective July 1, 1954, fertilizer grade-tonnage may be reported in either of two ways: 1. By sending the Commissioner of Agriculture a copy of the invoice or order, minus price quotation, on each shipment in or into the State, within 30 days after shipment is made. 2. By summary reports submitted on or before Jan. 31 of each year covering July 1 through Dec. 31 shipments of the preceding year and on or before July 31 covering shipments made between Jan. 1 and June 30 of that year.

Angus Elected

The Fertiliser Society (of England), at its sixth annual general meeting held at Ascot, June 25, elected J. Angus, president and J. T. Procter, vice-president.

Ammoniator Described

A continuous ammoniator developed by TVA is described in the National Fertilizer Association periodical, *Process Progress.*

The July issue tells how TVA made the ammoniator after conducting studies on the ammoniation of superphosphate.

The unit will be demonstrated to members of the fertilizer industry Sept. 15 at Sheffield, Ala.

Industrial News

California Scientists Test Spray Effectiveness

A one-third reduction in spraying requirements for insect control may result from experiments being conducted by the University of California.

Research already has been conducted to determine important factors of insecticides in making spray applications more effective, according to Nuri Malley of the University.

The size of crystals remaining, when insecticides in solution have evaporated, seems to be determined by the size of spray droplets. The crystal size also seems to be linked to the efficiency of the spray.

Uniform spray droplets may be produced in desired sizes by a machine made by the University. A rotating flat disk, which can be regulated to produce droplets of from 100 to 1,000 microns is contained in the machine.

Results indicate that the larger crystals are more toxic by one-half than fine, colloidal crystals, according to Malley.

More research is planned to find the most effective sizes of crystals for various insects.

Central Chemical Sells Stock of Fertilizer Plant

Central Chemical Corp. of Hagerstown, Md. sold its 50 per cent interest in the fertilizer and insecticide plant operated at Lebanon, Pa. to Vernon Bishop, according to an announcement made last month by Franklin M. Thomas Sr., president.

Bishop now is full owner of the Lebanon plant, which will change its name from Central Chemical Corporation.

Reagan Gets BEPQ Post

Eugene P. Reagan last month became assistant chief in charge of regulatory activities of the USDA's Bureau of Entomology and Plant Quarantine.

Reagan, assistant leader of the Division of Plant Quarantine since 1945, fills a post vacant since the late S. A. Rohwer transferred from the Bureau in 1950.

Industrial News

Production of Pesticides and other Farm Chemicals, 1951 and 1952

	PRODUCTION (million lbs.)		SALES (Million lbs. and dollars)			
			1951		1952	
	1951	1952	Pounds	Value	Pounds	Value
Cyclic pesticides and other cyclic chemicals	407	372	319	$135	289	$111
Acyclic pesticides and other acyclic organic farm chemicals	57	46	46	$ 16	42	$ 23
All pesticides and other organic farm chemicals	464	418	364	$150	331	$133

A decrease in production of all pesticides and other organic farm chemicals was reported for 1952 in preliminary statistics released by the U. S. Tariff Commission.

Production of 418 million pounds represented a 10 per cent drop from figures for 1951.

Sales in 1952 also declined to $133 million from $150 million reported the previous year. Other figures are shown in the table.

Rasor Heads Crop Survey Service in North Carolina

Henry L. Rasor, former state agricultural statistician in charge of the Louisiana office of the cooperative crop reporting service, has been appointed to a similar position in North Carolina.

He succeeds Frank Parker, who retired April 30 after more than 30 years' service as chief agricultural statistician.

Fertilizer Shipments Drop

A decrease of 74,000 short tons was shown in reports from eight states of fertilizer shipments and tax tag sales in June compared with the same month in 1952.

Shipments and tag sales for the 11 months ending May 31, 1953 are equivalent to 10,229,000 tons. This is an increase of 215,000 tons over the 10,014,000 tons reported for the same period last year, according to a National Fertilizer Association report.

OEEC Plans to Exchange Agricultural Information

Under an arrangement with the U. S. Mutual Security Agency the O. E. E. C. will "establish and operate an exchange of technical agricultural information and will organize and carry out training courses and work-shops on agricultural subjects for the benefit of the member countries."

The M. S. A. announced it is prepared to make available $473,000 from its holding of 10 per cent counterpart funds for the financing of these projects.

USDA Reports Chlordane Excellent for Ant Control

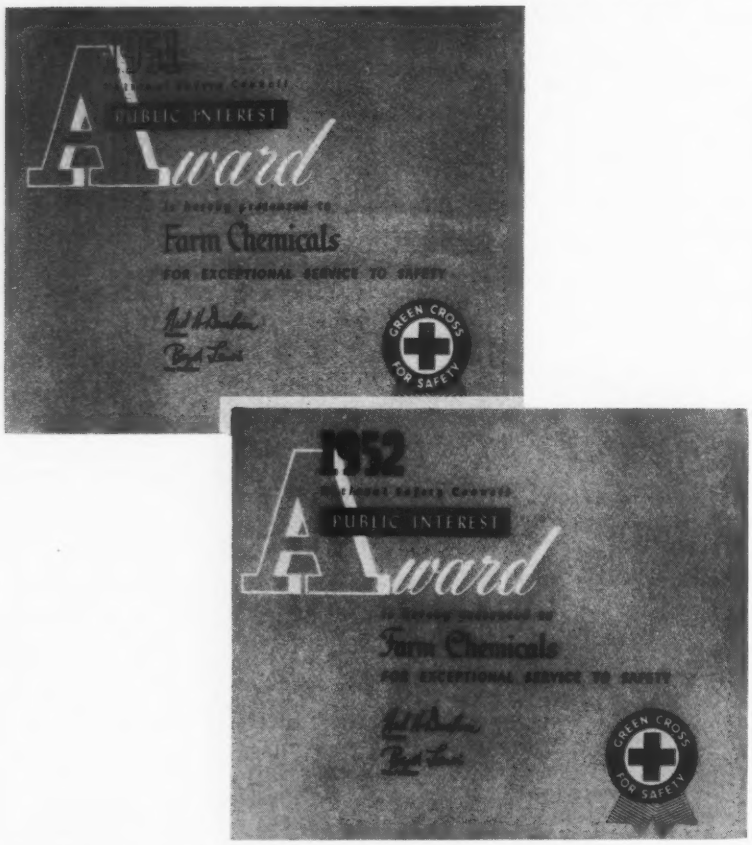
Ants may be controlled easily in the home through the use of chlordane, say USDA entomologists in "Ants in the Home and Garden—How to Control Them," a recently issued bulletin from the department.

Outdoor-nesting ants may be completely destroyed by pouring a water emulsion of chlordane into their nest tunnels and on the ground surface surrounding the tunnel entrance. Entomologists advise washing the chemical into the nest by watering the treated ground surface with a hose.

Indoors, control frequently must be achieved without finding their nests. The booklet recommends treating surfaces where the ants crawl with chlordane oil spray.

Industrial News

Second in Row for Farm Chemicals



ANOTHER SAFETY AWARD: Farm Chemicals is the only magazine in the field to win the National Safety Council's Public Interest Award for "exceptional service to safety two years in a row. Shown is the plaque presented to publisher Sam Lewis Veitch at NFA convention, with 1951 award.

Grace Chemical Makes Three Personnel Moves

Three personnel changes recently were made at Grace Chemical Co., according to an announcement by William P. Gage, president.

Vincent L. Rebak is New York district sales manager. Prior to his promotion, he was assistant to the vice president in charge of sales for Dodge and Olcott.

C. J. Bown was named Memphis district manager for the company. Before joining Grace in 1952, he was associated with Celanese Corp. of America and Union Carbide & Carbon Corp.

D. Brittain Briggs, formerly a process engineer with Carthage Hydrocol in Brownsville, Tex., recently joined Grace as technical assistant for the new nitrogen plant now under construction near Memphis.

Phillips, Allen Retire

A. V. Phillips and H. H. Allen, directors and board members of Bemis Bro. Bag Co., have retired after a combined 126 years with the company. T. W. Little and R. M. Hersey have been elected to the board of directors to fill their unexpired terms.

Phillips joined Bemis in 1891 serving on the board 42 years.

Allen joined Bemis in 1889 and for 41 years has been a board member.

Increased Effectiveness Of Aramite Is Announced

Aramite now is effective on approximately three times the number of crops it was used on a year ago, Naugatuck Chemical Div., U. S. Rubber Co., which developed the mite killer, reported last month.

Testing at the division's agricultural laboratory in Bethany, Conn., and at state agricultural experiment stations throughout the country has demonstrated it now can be used on cotton, pears, prunes, watermelons, cantaloupe, blueberries, raspberries, strawberries, celery, soybeans, sweet corn, tomatoes, roses, alfalfa and clover, according to the company.

Previously Aramite had been found useful on apples, peaches, grapefruit, lemons, oranges, beans, almonds, walnuts, nursery stock and shade trees.

Naugatuck began country-wide testing of its miticide approximately four years ago. These tests, it says, conducted at experiment stations in all 48 states, demonstrated the chemical kills citrus bud mite, citrus red mite, European red mite, clover mites, Lewis mite, Pacific mite, red spider mite on cotton, six-spotted mite, spruce mite, two-spotted mite including the Parathion resistant variety and the Willamette mite.

New Association

Oklahoma Plant Foods Association, Inc. plans to help farmers in its state learn "how to get the most out of fertilizers."

The newly organized association will make available to farmers bulletins on the proper use of fertilizer. The association will hold a series of field days in cooperation with Oklahoma A. & M. College.

A speakers bureau also will be sponsored by the group, comprising experts in the field of fertilizer use who will be available for talks at farm meetings.

OPFA officers are C. C. Crawford, president; James Gillie, vice president; Arnold Neuman, treasurer and L. L. Jaquier, secretary.

Industrial News

Midwest Farmers Kill Two Bugs With One Spray

Some Midwest farmers got an extra dividend this season when they sprayed methoxychlor on their alfalfa and clover for spittlebug control. The insecticide not only gave good control of the spittlebugs, DuPont reports, it also succeeded in stopping infestations of the armyworm.

In one sprayed field near Snow Hill, Ind., the company reported, there were no armyworms at all, even though they were numerous in surrounding fields and in grass along a bordering railway.

USDA Describes Research Work at Four Laboratories

The story of research resources of the USDA's Bureau of Agricultural and Industrial Chemistry is told in a special explanatory document issued by the bureau.

Included is information on four regional research laboratories and 11 other branch stations. Copies may be obtained from Dr. Walter M. Scott, Assistant Chief, BAIC, South Building, USDA, Washington 25.

Cal Spray Reports Good Control With Orthocides

"Orthocide" dusts and "Orthocide 50", because of their effectiveness in controlling certain vegetable diseases, are drawing widespread attention of vegetable growers, according to California Spray Chemical Corp., the producer.

Effective control against a wide range of the important fungus diseases of vegetables is offered by the chemicals, Cal-Spray states.

Article Gives Review Of Aerosol Development

The 10-year anniversary of development of aerosol bombs is the occasion of an interesting review in the July issue of *Agricultural Research*, USDA publication.

The feature tells of the first usage of the bombs, by servicemen in World War II, and goes on to trace development of the product and many uses for which it is employed.

Rotenone Checks Beetles, Protects Against Wilt

Two purposes may be served through dusting cucumber plants with rotenone, according to New York State Experiment Station specialists.

Beside protecting the plants against beetles which feed upon them, the dust guards the plants against infection by bacterial wilt organisms which are transmitted by the pests.

A fungicide such as zerlate may be combined with this dust for the control of fungous diseases, according to the station.

Bollweevils, grasshoppers heavy . . .

United States Pest Survey

Boll weevil infestations were reported heavy or increasing in many cotton growing areas through the period ending July 17. Investigators in Ga. found 99 per cent of the fields examined infested with an average of 36 punctured squares in untreated fields and 20 per cent in those which had been treated.

A threatening invasion of grasshoppers in south central Colo. developed "full potential" by early July, involving more than one and a half million acres of private range land with populations ranging from seven to 75 per square yard.

Control operations capable of treating 300,000 acres of the most severely affected land before egg deposition got under way July 6. Control of a 300,000-acre infestation in northeast N. M. was scheduled to start July 15.

Grasshopper control measures were stopped throughout the infested disaster panhandle areas of Tex. and Okla. and southeast Colo. because of the advanced development of the pests. According to reports from the area, serious problems may arise next year.

Here are some other reports of special interest taken from Federal and state bulletins through the period ending July 17:

Boll Weevil—Va. reported rather heavy infestations and in Tex. the pest was termed heavy in south and south central areas as well as some upper coastal counties.

Weather conditions hampering dusting and spraying activities in S. C. combined with the emergence of new weevils from squares resulted in increased infestations throughout most of the state. As of July 11, 757,000 acres of cotton had been treated, 450,000 acres during the previous week.

Elsewhere in the country the weevil situation was somewhat better. Dry weather in Miss., with increased fruiting and general application of pesticides, held the infestation to one of the lowest recorded for that time of year. Low infestations were found in most treated Okla. fields and the situation in most untreated fields was not alarming. Although heavy in some southwest Ark. fields, infestations generally were very low and a decline in the western Tenn. area was recorded.

This survey was extracted from the weekly Cooperative Economic Insect Report issued by the Bureau of Entomology and Plant Quarantine, USDA, and from weekly reports of infestations from individual states. It is presented for the use of the pesticide industry to aid in marketing products when and where they are needed.

Bollworms—Heavy damage is anticipated in some areas of Tenn. and the worms were injurious on more succulent fields of the upper coastal, south central and central areas of Tex.

The pest continued to increase in S. C. where growers were not on a four to five day schedule or were not using DDT in insecticides other than toxaphene or endrin. It was reported as prevalent in 11 N. C. counties and appeared in many fields in Yuma Co., Ariz. Ark. showed a decrease in infestation from last year and only local fields in Miss. were threatened.

Cotton Leafworm—Discovery of leafworms in two Tex. counties indicated some migration from the upper coastal area and the pest has been found in four new counties.

Spider Mites—Cotton. Spotty to increasing infestations reported in Ark., Ariz., N. M., N. C., S. C. and Tex. Control was warranted in many Ariz. fields.

European Corn Borer—A large second generation was termed possible in Ill. where much corn in the central area was well ahead of last year and where borer survival was relatively high.

Scattered heavy infestations were present in Pa., especially in early planted corn and in three Mich. areas larvae were entering the whorls of field corn.

Grasshoppers—Dangerous populations still were present in fence rows, roadways, and in corn and other crops in southern and some northern Ill. areas. The infestation was spotty in Mo., with heavy damage in some areas.

As of July 7, reports of abundance from various Utah areas indicated an increasingly serious threat to crops unless controls were applied. A heavy infestation of adults was present on about 2,000 acres in Ida.

Chinch Bugs—Damage to corn was reported in central and northwest O. and, with migrations over, populations in Ill. were higher than normal. With normal rainfall or less, late summer damage was expected in thin corn and late summer grasses in the latter state.

Spider Mites—Fruit. Red spider mites were heavy in southeast and southwest Mo. but were controlled where aramite was applied. In the southwest area where parathion was used with DDT, there were indications that the application was not a suitable control.

European red mites in Md. and Pa., accompanied by the two-spotted mite in the latter state, continued to build up on apple. In N. J. populations large enough to cause serious injury unless controls were applied were present in some peach and apple orchards. Build-ups also were reported from south-

Industrial News

ern Ill., western Ky. and Del.

Severe mottling occurred in some orchards of the Vincennes, Ind. area and a very heavy attack in the Orleans area caused considerable bronzing in some orchards.

Aphids—Populations were increasing rapidly in untreated and some treated potato fields near Presque Isle, Me. A tremendous buildup of hop aphid on many southwest Ida. hop fields was recorded. Areas were being treated at the time the report was made.

Codling Moth—On July 17, the pest was reported as the most important Mo. orchard problem.

Alfalfa Plant Bug—This insect which has caused some trouble in the Midwest recently was uncovered in the East. Reports from Md. indicate it has been found in two counties.

Potato Leafhopper— Many south central Pa. alfalfa fields have been yellowed and early-cut fields in the southwest were stunted and yellow. Serious damage to new alfalfa seedlings in some southeast and west Ia. areas was reported with the infestation reported as probably general.

Effect of Active Carbon on Longevity of Parathion in Spray Residue

Exposure Period	First Series		Second Series	
	With Carbon	Without Carbon	With Carbon	Without Carbon
1 week	89.5	74.5	95.5	81.0
2 weeks	83.0	68.5	91.0	64.0
3 weeks	70.0	54.4	92.0	51.0
4 weeks	66.5	51.5	88.0	48.5
5 weeks	57.5	44.5	87.5	37.5

Shortly after parathion was distributed as an experimental insecticide some workers reported a rapid loss of the insecticide from spray residues. From the viewpoint of insect control this is a distinct disadvantage. Parathion also caused foliage injury on certain varieties of apples. This restricted its use until it was found that Nuchar active carbon acts as a safener and prevents foliage injury without reducing the efficiency of the parathion.

These facts are contained in a research report by Charles W. Aman, research chemist of West Virginia Pulp & Paper Co., Tyrone, Pa.

Subsequent work was conducted to determine prolongation of parathion residuals by active carbon. Two series of laboratory tests established that presence of active carbon diminishes the rapid loss of parathion from spray residues. The accompanying table gives the per cent of parathion remaining after the various periods of exposure.

Bersworth Fellowship Awarded Illinois Grad

The first Bersworth Fellowship in Chelate Chemistry has been awarded Daryle H. Busch, a graduate chemistry major at the University of Illinois. The fellowship carries a stipend of $3500 and will provide Busch with one year of graduate study and research on metal chelates at University of Illinois.

Metal chelate compounds have been found to have an increasing number of applications in agriculture, industry and medicine in recent years.

Normal Super Down In May

A decrease of 12 per cent in production of normal superphosphate and an eight per cent increase for concentrated were shown in May as compared with April's output, according to a report from the U. S. Department of Commerce.

In May, 858,077 short tons of normal, 93,917 tons of concentrated and 1,824 tons of wet-base goods were produced.

Shipments of normal were 39 per cent less and concentrated 13 per cent less than April.

. . . Insecticides for Grasshoppers

(*Continued from page 45*)

a kill of 99 per cent. In seven of the trials, which were in green to drying alfalfa under moderately high temperatures, all three dosages gave kills of 95 per cent or above

In dry alfalfa under dry, hot conditions of midsummer in six of the trials the four-ounce dosage gave an average kill of only 61 per cent and dosages of six and eight ounces per acre gave kills of only 79 per cent. The four-ounce dosage in solution applied by aircraft to range land in Montana gave an average kill of 99 per cent in five trials.

Dosages of two and three ounces per acre of heptachlor were tested in green alfalfa in Arizona in 1952. In seven trials two ounces per acre gave an average kill of 92 per cent. The three-ounce dosage averaged 96 per cent.

Compound 1189

Compound 1189 was applied by turbine blower to alfalfa in Arizona in 1950 and 1951. Both a wettable-powder suspension and an emulsion were used in preliminary tests in 1950, but the results were not separated. In 1951 tests in alfalfa were made with an emulsion. Applications by turbine blower on range land in Montana were made with an emulsion in 1950 and a solution in 1951.

In a total of 22 trials in which compound 1189 was applied at 0.5 pound per acre the average kill after three–four days was 78 per cent. In 45 trials at 0.75 pound per acre the average kill was 86 per cent and in 22 trials at 1 pound, 87 per cent. Kills five–seven days after application were three, five and four per cent higher for dosages of 0.5, 0.75 and one pound.

CS-708 (Dilan)

Preliminary tests with CS-708 were made in Arizona and Montana in 1950. Dosages of 0.75 and one pound per acre were applied in emulsion in alfalfa in April, July and September and compared with a standard spray treatment of one pound of chlordane per acre. In the early and mid-season tests 0.75 pound of CS-708 yielded results six and 24 per cent lower than the standard. When it was applied at one pound per acre in late season, the average kill was only two per cent under that of the standard. In eight trials on range land in Montana 0.75 pound averaged four per cent less than the chlordane application.

Dosages of 0.5 and 0.75 pound per acre were tested in direct comparisons in Arizona and Montana in 1951. In 15 trials, eight of emulsion and seven of solution, the 0.5-pound dosage averaged 89 per cent kill after three–four days. The 0.75-pound dosage averaged 92 per cent in the same number of trials. These tests were made in green alfalfa in Arizona and on range land in Montana. In 13 trials in drying and dry alfalfa in Arizona the 0.75-pound dosage averaged 79 per cent kill and the one-pound dosage 80 per cent.

The results of these experiments are not sharply defined and the small difference in kill might easily be accounted for through experimental error. They do indicate that CS-708 is more toxic to grasshoppers under cool temperatures in green alfalfa than it is under moderate to high temperatures in drying and dry alfalfa. The kills after five–seven days throughout all of the tests were equal or slightly under those after three–four days, indicating a rapid drop in residual action.

Lindane

In 1950 lindane emulsion was applied by turbine blower to alfalfa in Arizona at 0.5, 0.75 and one pound per acre.

In all of these tests lindane showed a tendency toward reduced toxicity under higher temperatures. There was little or no evidence of residual kill.

Methoxychlor

Methoxychlor in emulsion was applied by turbine blower to green alfalfa in April and to drying alfalfa in July. The three-pound dosage gave an average kill after three–four days of seven per cent lower than the standard chlordane application of one pound per acre. In the July tests the same dosage dropped to 20 per cent below the standard. In late September on dry alfalfa a dosage of four pounds gave an average kill of 75 per cent compared with 88 per cent from the standard treatment. Moderate to severe burning of alfalfa was noted in the July and September tests.

In a limited number of trials on range grass in Montana a three-pound dosage averaged 91 per cent.

EPN

EPN was tested on green alfalfa in April, 1952 in Arizona. A dosage of two ounces per acre in emulsion gave an average kill of 61 per cent in seven trials. A six-ounce dosage gave 90 per cent kill. ◆

New Book Describes Plant Maintenance

Growing interest in maintenance for cost reduction is reflected in the latest volume, "Techniques of Plant Maintenance—1953," which was published July 1 by Clapp & Poliak, Inc., the firm which established the Plant Maintenance & Engineering Show and the concurrent conference.

The volume contains the text of 61 sessions on various aspects of maintenance and plant engineering held in Cleveland in January. The current volume is the largest in the series, more than 100 pages thicker than its 1952 companion book.

Safety Council Issues New Industrial Booklet

Instructions in safe work habits applicable to employes in farm chemicals plants are included in a booklet recently issued by National Safety Council.

Entitled "Working Together for Safety," it lists general safety regulations and special sections on machine operation, hand tools, power tools, protective clothing, fire prevention, materials handling and other topics.

Sample copy and prices for quantities are available from the council, 425 N. Michigan Avenue, Chicago 11.

. . . Sauchelli on Fertilizer Industry

(*Continued from page 19*)

culture and the nation has our industry had a greater opportunity to serve the public interest and incidentally its own, than this of the next 25 years.

How to meet this challenge? By raising our sights—and particularly by overhauling many of the traditional methods of merchandising our products. Farmers are now better informed, better trained, more receptive to new ideas than in the past. They want the help which our products can give them in meeting their production problems and in making their operations pay a profit.

Sales policies and selling techniques need revamping and modernizing, to fit in with our broader concept of service. In this jet-powered era, where is sales efficiency? Sales methods are still in the Model T stage. We are in the situation in which scientists, government agencies, and many of our own leaders are creating demand, and production engineers perfecting techniques and equipments in order to produce more at lower unit cost. But, to what purpose their tireless efforts unless distribution plays its essential coordinate role?

Sales Indispensable

Sales is the catalyzing agent that joins production and consumption to yield profit—that indispensable ingredient so necessary to new growth under the competitive enterprise system. How can we make the farmer realize that the best investment he can make is that small profit-margin our industry requires in order to support needed research, improved distribution services and development of better fertilizers at lower cost per unit of plant food? Selling our product at the cheapest per ton price will not benefit him in the long run.

We all have reason to be optimistic about the future. Certainly, tomorrow's fertilizer processes and products will be superior to those of today. Research is a powerful agency of change in the modern world. Agriculture is not now making full use of the fertilizer tool already developed by research. Tradition and habit are formidable obstacles to scientific advances not only on the farm but in business also. But we must push forward.

Reappraisal Needed

Old materials and plant locations need reappraisal in order to justify themselves under our changed economy. Transportation costs necessitate a study of present locations with reference to the consuming areas to be served and the size and diversity of the markets to be reached economically. We have had 13 years of consecutive increases in the consumption of fertilizers—a sellers market. It may be that from now on we may be entering a new phase—a buyers market. But we know that without fertilizers in adequate amounts, modern farming practices cannot get the maximum acre yields and the highest output per man.

Our product must be used increasingly if modern agriculture is to produce the food and fiber for the growing populations of the world.

What industry has a greater potential business or opportunity for growth than ours? Business is literally being created for us by other agencies—population growth, agronomic and soils science research and promotion by federal and state government agencies. We need the vision and imagination and courage to grasp it.

Let us stop worrying about and autopsying the dead yesterdays. We have today and tomorrow. Last year the country's agriculture consumed 22 million tons of fertilizer and about 30 million tons of lime.

By 1965 it is estimated our agriculture will be consuming about 30 million tons of fertilizers or about 10 million tons of actual plant food. Fantastic? Not at all. Back in the late 20's who would have prophesized that in 25 years American farmers would be consuming 22 million tons of fertilizers? That would have been considered lunacy. Let us set our sights high. Then, let creative salesmanship hit that target. ◆

Light Traps Successful In Detecting Bollworm

Electric light traps have practical value in detecting the presence of the pink bollworm on cotton in areas not previously known to be infested.

This is shown by experiments being conducted as a joint project by the Bureau of Plant Industry, Soils and Agricultural Engineering, the Bureau of Entomology and Plant Quarantine and the Texas Agricultural Experiment Station.

Possible uses of the traps:

1. locating new infestations,
2. migration studies,
3. timing insecticide applications and
4. determining intensity of infestation from field to field and from year to year.

Light traps have not been recommended to farmers as a means of control.

CFA Fertilizer Handbook Will Be Out This Month

California Fertilizer Association's "Western Fertilizer Handbook" will be available for distribution sometime in August, according to Earl J. Shaw, chairman of the handbook sub-committee.

The Soil Improvement committee of the association has just completed the manuscript after more than three years of intensive work.

The handbook is expected to contain 162 pages, 5¼ x 7¾ in size and include a number of four-color reproductions, 12 chapters of text, a comprehensive glossary of tables, terms and useful conversions of value to farm operators and home gardeners.

A public demand of 15,000 or more copies is indicated by prepaid orders already received, the association reports.

OEEC To Start Exchange

An exchange service for agricultural information will be established for member countries by the Organization for European Economic Cooperation, according to an announcement made by the organization last month.

. . . Pacific Northwest Meeting

(*Continued from page 29*)

ers have sometimes been written in such a way as to be misleading to scientists in areas where liquid formulations have not been available.

Some of the data presented:

1. Drill bands of liquid fertilizer are taken up by plants without either rain or irrigation. This makes liquid formulations more efficient when water supply is insufficient for any reason.

2. Drill bands of ammonia solutions have been found to produce nitrate in plants in larger amounts at the first than from bands of dry or gaseous ammonia materials. Ammonia solution drill bands also have been found to produce nitrate over a longer period of time than the other formulations.

3. Phosphoric acid frequently has been found to produce superior results when compared to superphosphates. Examples included these crops: citrus, vegetables and alfalfa.

Chelated Compounds. New Tricks in Minor Element Nutrition of Plants—*C. Emlen Scott, specialist in Plant Pathology, Cal. Extension Service.*

In almost every county in California there are fruit trees, nut trees or grapevines which can be greatly benefited by applications of zinc, boron, iron, manganese or copper. Zinc deficiency is the most important in terms of acreage involved and potential loss of crop and copper deficiency is the most limited in distribution.

Each one of these deficiencies may be corrected either by soil applications, foliage or dormant sprays or trunk injections. Zinc can be supplied with fair results as a spray in most cases except for cherry, walnut and grape for which more efficient methods are needed.

Boron deficiency readily can be corrected with soil applications. Response from manganese and copper as foliage sprays has been excellent in all cases where these deficiencies exist. Satisfactory correction of iron deficiency in calcareous soils has been attained only by trunk injections.

Production has been maintained in one pear district for 25 or 30 years by the use of this method. Field tests made during the past two seasons in cooperation with J. P. Bennett and Louis Jacobsen indicate that chelated iron in the form of an iron complex of ethylenediamine tetraacetic acid (EDTA) applied as a foliage spray may be developed as a commercial treatment for Bartlett pear.

The margin of safety is narrow and compatibility with other spray materials has not been explored. There has been no indication that soil applications of iron EDTA will be effective on these highly calcareous soils. The zinc complex of EDTA is being tested for the first time this season. No tests of the complexes of boron, manganese or copper are planned because deficiencies of these elements readily are corrected by present methods.

We Still Have New Frontiers—*John R. Taylor Jr., agronomist, American Plant Food Council, Inc.*

Today, as never before, the emphasis is on maximum profits per acre consistent with good farming practices which maintain and improve the land. The rush to get on the "maximum economical yield band-wagon" is comparable to the Gold Rush of the Forty-niners, but is not limited to any one area. It is nationwide in scope.

Research, education, new methods and new ideas are being rolled into a package suitable for use on individual farms—a package that too often in the past was divided into many small parcels.

Even with this vast added knowledge and recent increases in production, new frontiers and opportunities still lie at our feet, just waiting to be developed. In this field, the adequate and efficient use of fertilizer is an outstanding example. A recent report by federal and state research workers shows that here in the western states, farmers are getting less than half of the potential yields on present plantings of wheat, hay and corn.

Increased fertilization with phosphate and nitrogen would boost hay yields nearly six million tons—equivalent to three million acres under present conditions. Corn yields could be increased 10 bushels per acre or a total of 10 million additional bushels in this area alone. Pasture fertilization is in its infancy.

Research should be continued and expanded for both current and future use but for maximum profits next year, greater emphasis must be placed on new frontiers in terms of higher economical yields on each acre.

Soil Testing—*Robert E. Whiting, director, Growers' Advisory Service, Plant Food Div., Swift and Co.*

1. Soil testing is important to industry in that we are provided with part of the knowledge needed to guide our formulation of fertilizers and to determine in which areas those of a particular analysis would be best suited for crop use.

Admittedly, analysis of the soil is not a cure all. But, where no previous cropping or trial information is available, we are able to come closer to actual soil and plant needs with respect to nutrient application and corrective procedures.

2. Soil testing is important to the general public because it provides the agricultural consumer with a more precise view of the inherent capabilities of the land he is using to produce food and fiber for the national welfare and for the support of his personal economy. ◆

Sewerage Commission To Make Vitamin B-12

The Milwaukee Sewerage Commission and the Vern E. Alden Co., Engineers, Chicago, have entered into an agreement that will put them into the vitamin business. Under an exclusive contract with the commission, the engineering firm will produce Vitamin B-12 concentrate from Milorganite.

The vitamin is effective against pernicious anemia and has important influence on growth.

Milorganite is the dried and disinfected sludge from the Municipal Sewerage Disposal Plant and was coined from the words "Milwaukee organic nitrogen."

The contract may yield the Sewerage Commission several hundred thousand dollars the first year of commercial operation, with bright prospects for a higher return as markets for the vitamin materials expand.

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

ALDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Julius Hyman & Co. Div., Shell Chemical Corp., Denver, Colo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

AMMONIA—Anhydrous and Liquor
Commercial Solvents Corp., New York City
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM NITRATE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corp., New York City
Lion Oil Co., El Dorado, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM PHOSPHATE
Monsanto Chem. Co., St. Louis, Mo.

AMMONIUM SULFATE
See Sulfate of Ammonia

AMMONIUM SULFATE NITRATE
Baker & Bro., H. J., New York City

BAGS—Burlap
Bemis Bros. Bag Co., St. Louis, Mo.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Multiwall-Paper
Bemis Bro. Bag Co., St. Louis, Mo.
International Paper Co., Bagpak Div., N. Y. C.
Hammond Bag & Paper Co., Wellsburg, W. Va.
Hudson Pulp & Paper Corp., N. Y. C.
Jaite Company, The, Jaite, Ohio
Kraft Bag Corporation, New York City
McIver & Son, Alex. M., Charleston, S. C.
Raymond Bag Co., Middletown, Ohio
Union Bag & Paper Corp., New York City
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES
Fischbein Co., Dave, Minneapolis, Minn.
International Paper Co., Bagpak Div., N. Y. C.

BAG CLOSING—THREAD & TWINE
Bemis Bros. Bag Co., St. Louis, Mo.

BAG PRINTING MACHINES
Schmutz Mfg., Louisville, Ky.

BAG FILLING MACHINES
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

BHC AND LINDANE
Ashcraft-Wilkinson Co., Atlanta, Ga..
Commercial Solvents Corp., New York City
Diamond Alkali Co., Newark, N. J.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Wyandotte Chemicals Corp., Wyandotte, Mich.

BONE PRODUCTS
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
McIver & Son, Alex M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID
American Potash and Chem. Corp., N. Y. C.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BUCKETS—Hoist, Crane, etc.
Hayward Company, The, New York City

CALCIUM ARSENATE
American Agricultural Chemical Co., N. Y. C.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.

CARS AND CART
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

CASTOR POMACE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
McIver & Son, Alex. M., Charleston, S. C.

CHEMISTS AND ASSAYERS
Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Wiley & Company, Baltimore, Md.

CHLORDANE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C
Pittsburgh Agricultural Chemical Co., N. Y. C.

CLAY
Ashcraft-Wilkinson Co., Atlanta, Ga.

CONDITIONERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio

CONTROL SYSTEMS
Sackett & Sons Co., The A. J., Baltimore, Md.

CONVEYORS—Belt
Sackett & Sons Co., The A. J., Baltimore, Md.

COPPER SULFATE
Phelps Dodge Refining Corp., New York City
Tennessee Corp., Atlanta, Ga.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa

DDT
Ashcraft-Wilkinson Co., Atlanta, Ga.
Diamond Alkali Co., Newark, N. J.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Wyandotte Chemicals Corp., Wyandotte, Mich.

DIELDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.
Julius Hyman & Co. Div., Shell Chemical Corp., Denver, Colo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

DILUENTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Wyandotte Chemicals Corp., Wyandotte, Mich.

DITHIOCARBAMATES
Berkshire Chemicals, New York City

DRYERS
Sackett & Sons Co., The A. J., Baltimore, Md.

ELEVATORS—Bucket
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

EMULSIFIERS
Atlas Powder Co., Wilmington, Del.
Wyandotte Chemicals Corp., Wyandotte, Mich.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City
Fairlie, Inc., Andrew M., New York City
General Industrial Development Corp., N. Y. C.
Marietta Concrete Corporation, Marietta, Ohio
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.
Titlestad Corporation, Nicolay, New York City

FERTILIZER—Mixed
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.

FILLERS
McIver & Son, Alex. M., Charleston, S. C.
Universal Detergents Inc., Long Beach, Cal.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

FULLER'S EARTH
Ashcraft-Wilkinson Co., Atlanta, Ga.

FUNGICIDES
American Agricultural Chemical Co., N. Y. C.
Berkshire Chemicals, New York City
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.
Tennessee Corp., Atlanta, Ga.

GAS MASKS
Willson Products, Inc., Reading, Pa.

GOGGLES
Willson Products, Inc., Reading, Pa.

HERBICIDES
Diamond Alkali Co., Newark, N. J.
Lion Oil Company, El Dorado, Ark.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Wyandotte Chemicals Corp., Wyandotte, Mich.

HERBICIDES—Oils
Gen. Chem. Div., Allied Chem. & Dye. N.Y.C.
Lion Oil Company, El Dorado, Ark.

HOPPERS & SPOUTS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind..

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Berkshire Chemicals, New York City
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

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American Agricultural Chemical Co., N. Y. C.
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Berkshire Chemicals, New York City
Commercial Solvents Corp., New York City
Diamond Alkali Co., Newark, N. J.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Julius Hyman & Co. Div., Shell Chemical Corp., Denver, Colo.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Virginia-Carolina Chemical Corp., Richmond, Va.
Wyandotte Chemicals Corp., Wyandotte, Mich.

IRON SULFATE
Tennessee Corp., Atlanta, Ga.

LEAD ARSENATE
American Agricultural Chemical Co., N. Y. C.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.

LIMESTONE
American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio
Pittsburgh Agricultural Chemical Co., N. Y. C.

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Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making and Handling
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Acidulating
Chemical Construction Corp., New York City
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Ammoniating
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Granulating, Fertilizer
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Grinding and Pulverizing
Atlanta Utility Works, The, East Point, Ga.
Bradley Pulverizer Co., Allentown, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Material Handling
Atlanta Utility Works, The, East Point, Ga.
Hayward Company, The, New York City
Hough, The Frank G. Co., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

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Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Power Transmission
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY
Superphosphate Manufacturing
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MAGNESIUM SULFATE
Berkshire Chemicals, New York City

MANGANESE SULFATE
McIver & Son, Alex. M., Charleston, S. C.
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MANURE SALTS
Potash Co. of America, Washington, D. C.

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MIXERS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

NITRATE OF POTASH
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NITRATE OF SODA
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NITROGEN SOLUTIONS
Commercial Solvents Corp., New York City
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Lion Oil Company, El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

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American Agriculture Chemical Co., N. Y. C.
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Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray
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Spraying Systems Co., Bellwood, Ill.

PARATHION
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Pittsburgh Agricultural Chemical Co., N. Y. C.

PENTACHLOROPHENOL
Monsanto Chemical Co., St. Louis, Mo.

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Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID
American Agricultural Chemical Co., N. Y. C.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Monsanto Chemical Co., St. Louis, Mo.
Virginia-Carolina Chemical Corp., Richmond, Va

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Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
General Industrial Development Corp., N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
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Baker & Bro., H. J., New York City
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Jackle, Frank R., New York City
Lion Oil Co., El Dorado, Ark.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
United States Steel Corp., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA
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SULFUR
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Texas Gulf Sulphur Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying
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Pittsburgh Plate Glass Co., Pittsburgh, Pa.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID
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Ashcraft-Wilkinson Co., Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
Monsanto Chemical Co., St. Louis, Mo.
McIver & Son, Alex. M., Charleston, S. C
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SURFACE ACTIVE AGENTS
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Baker & Bro., H. J., New York City
Davison Chemical Corporation, Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

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Baker & Bro., H. J., New York City
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC
Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TEPP
Monsanto Chemical Co., St. Louis, Mo.
Virginia-Carolina Chemical Corp., Richmond, Va.

TOXAPHENE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Pittsburgh Agricultural Chemical Co., N. Y. C.

2, 4-D
Diamond Alkali Co., Newark, N. J.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

2, 4, 5-T
Diamond Alkali Co., Newark, N. J.
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Miller Bill: Pro and Con

Lea S. Hitchner

Oveta C. Hobby

MEMBERS of the pesticide industry who were calmly awaiting passage of the Miller-Aiken bill got a rude jolt last month when an influential cabinet member, two federal judges and a commissioner of food and drugs expressed their opposition to it.

The Miller bill would provide amendments concerned with pesticide residues to the Federal Food, Drug and Cosmetic act.

It has received widespread support from the National Agricultural Chemical Association, industry members and farm organizations.

Cabinet Member Objects

Opposing the bill, Oveta Culp Hobby, Secretary of Health, Education and Welfare, recommended in a letter to the House Interstate Commerce Committee that the legislation either be revised or scrapped.

The federal judges, Chief Judge Harold M. Stephens of the Federal Appeals Court for the District of Columbia and Federal District Judge James W. Morris testified that the appeal provision of the bill would engulf the courts with heavy burdens.

The food and drug commissioner, Charles W. Crawford, testified that the chief fault of the bill is that it would tend to reverse a policy that unnecessary poisons should not be allowed to be present in foods.

Crawford declared that as the bill now stands it would open the way to return of practices common in 1906 and permit the use of poisonous preservatives.

Madam Hobby's objections included these:

The bill would require the secretary to establish tolerances even if a pesticide is not needed or its use can be avoided, "seriously weakening the present law";

It bars only foods containing pesticide residues from interstate commerce, rather than harmful pesticides themselves;

The advisory committee ought to have the power of arbitration;

Time Limit Too Brief

The time limit (90 days) would not be long enough in some instances to establish a tolerance; and

Lea S. Hitchner, executive secretary of NAC, representing pesticide industry members, gave strong support to the legislation, emphasizing points covered by the bill which he considered to be an improvement over present legislation.

His statement was similar to that included in the article on the Miller bill in the May FARM CHEMICALS. ◆

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What's Needed?

AS WEARY members of Congress were fleeing Washington for a long-awaited vacation, members of the pesticide industry wondered early this month what the fate of their pet piece of legislation—the Miller-Aiken pesticide bill—would be.

For a while, everything went along smoothly. Rep. A. L. Miller (R-Neb.) prepared the bill in cooperation with the National Agricultural Chemicals Association and other interested scientists and agricultural leaders.

It got quick and enthusiastic support from industry and farm groups in addition to individual members of the industry (see FARM CHEMICALS, May, 1953, page 13).

Everyone concerned apparently assumed the bill would pass in Congress with little or no opposition.

Then the roof fell in.

At hearings before a subcommittee of the House Interstate and Foreign Commerce Committee last month a barrage of criticisms was leveled at the proposed legislation.

The opposition, from Oveta Culp Hobby, secretary of Health, Education and Welfare, two federal judges and a commissioner of food and drugs, is summarized in the feature on page 75 in this issue.

It is unnecessary to reiterate the main objections to the legislation in this space.

The crux of the situation is that opposition to the bill has come from the top level in Washington that no doubt will play a dominant part in shaping the final pesticide bill.

What is more, the opposition to the Miller bill as it stands apparently crosses party lines and therefore is all the more significant.

Thus, with the battle lines drawn, the arguments were abruptly halted as Congress adjourned, leaving the proposed bill hanging fire until Congress reconvenes next January.

That doesn't mean NAC will let the matter drop until Congress resumes business.

Val Weyl, editor of *NAC News*, assured FARM CHEMICALS as we went to press that the association intends to give the legislation its full-time backing and will "see to it that it gets through in good form."

One of the biggest points of dispute, when the subcommittee gets together next year with interested government and industry representatives will be the first objection raised by Madam Hobby, that the bill would require the secretary to establish a tolerance (or exemption) even if a pesticide is not needed or its use can be avoided.

In the case of certain crops, it has been demonstrated in the past that in time of heavy infestations, use of a pesticide is a necessity to get any marketable yield.

In such cases it is easy to show "need" of the pesticide.

But, as any farmer knows, you can grow many crops without using pesticides (or fertilizers either, for that matter). The yields may be infinitesimal and the crop may be puny and contaminated by diseases and insects, but there would be yields, none the less.

Are pesticides "needed" in such cases? The answer, with food needs increasing every day, must be **yes**. We certainly need larger yields even though smaller ones may be possible using only sun and rain.

* * *

MADAM HOBBY and others objecting to this feature of the bill will do well to consider this statement by Dr. Fred C. Bishopp, who, until his recent retirement was assistant chief of the Bureau of Entomology and Plant Quarantine:

"*An abundance of high-quality food and fiber crops is absolutely dependent upon the use of a diversified group of insecticides. Without insecticides vegetables, fruits and cereals would be unmarketable even by low standards. Wormy apples, corn and cabbage, weavily cereals and other infested food stuffs, with the accompanying wastes of insects would reach the market in condition unfit for human consumption. Standards set by market inspectors and the Food and Drug Administration officials on insect contamination are guaranty that the food will reach the consumer in reasonably good condition.*"

Those asking "Are pesticides needed?" should be asked in turn "Is our high standard of living needed?"

—HAMILTON C. CARSON

• *Farmers' Angle*

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